

PROJECT FILE



United States Department of the Interior FISH AND WILDLIFE SERVICE

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In Reply Refer To
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Memorandum

To: Field Office Manager, Bureau of Land Management, Vernal Field Office, 170 South 500 East Vernal, UT 84078

From: Utah Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services, West Valley City, Utah

Subject: Biological Opinion for BLM Resource Management Plan (RMP), Vernal Field Office (VFO)

This document transmits the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion based on our review of potential activities described under the Resource Management Plan of the Utah Bureau of Land Management (BLM) Vernal Field Office (VFO) and their potential effects on the federally threatened Mexican spotted owl (*Strix occidentalis lucida*), Canada lynx (*Lynx canadensis*), Ute ladies'-tresses (*Spiranthes diluvialis*), Uinta Basin hookless cactus (*Sclerocactus glaucus*) and clay reed-mustard (*Schoenocrambe argillacea*); and federally endangered black-footed ferret (*Mustela nigripes*), bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*) and shrubby reed-mustard (*Schoenocrambe suffrutescens*) in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Critical habitat was designated for the Mexican spotted owl on February 01, 2001 and was re-designated August 31, 2004 (66 FR 8530, 69 FR 53181). Critical habitat was designated for the listed Colorado fish (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker) March 21, 1994 (59 FR 13374). Your August 22, 2008 request for formal consultation for all aforementioned species was received on August 25, 2008.

Vernal FO BLM Resource Management Plan proposed activities are categorized into the following 18 programs:

- Air Quality
- Cultural Resources
- Paleontological Resources
- Fire and Fuels Management

Lands and Realty Management
Livestock and Grazing Management
Minerals and Energy Resources
Recreation and Travel Management
Riparian and Wetland Resources
Soil and Water Resources
Special Designations Areas
Special Status Species Management
Vegetation Resources Management
Visual Resources Management
Wild Horse Management
Wildlife and Fisheries Management
Woodlands and Forestry Management
Non-WSA Lands with Wilderness Characteristics

This Biological Opinion and Conference Opinion is based on information provided in the August 22nd Biological Assessment, personal communications between the USFWS biologists and the BLM biologists, telephone conversations, email correspondence, conference calls, planning meetings, and other sources of information. A complete administrative record of this consultation is on file at this office.

Consultation History

This section summarizes significant steps in the consultation process. Additional correspondence, and email transmissions, that occurred between May 8, 2008, and September 25, 2008 are documented in the administrative record for this consultation.

- March 5, 2008: BLM electronically sent a draft Biological Assessment for the Vernal BLM Field Office Resource Management Plan to the USFWS for review;
- March 2008 through August 21, 2008: The USFWS reviewed and provided comments on the draft Biological Assessment;
- August 25, 2008: We received the final version of the VFO Biological Assessment and began formal consultation.

PROGRAMMATIC BIOLOGICAL OPINION

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DESCRIPTION OF THE PROPOSED ACTION

The proposed action examined in this consultation is the continuation of land management activities described by the Resource Management Plan (RMP). The RMP replaces two Land Use Plans (1985 Book Cliffs RMP and 1994 Diamond Mountain RMP) that provided management direction for the planning area. The Vernal RMP and the accompanying Environmental Impact Statement (EIS) will provide planning guidance for public lands managed by the Vernal Field Office (VFO) in Duchesne, Daggett and Uintah counties in eastern Utah for the next 15 to 20 years. RMPs are used by the BLM to guide and control future actions and set standards upon which future decisions on site-specific activities will be based. RMPs only establish general management policy on a broad scale. They are not used to make decisions that commit resources on a small scale such as on specific parcels of land. RMPs identify desired outcomes, also known as “desired future conditions”. These desired future conditions are expressed in RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes. These are often referred to as RMP decisions or resource allocations. It is upon these RMP decisions or resource allocations that the effects determinations in this Biological Opinion are based for:

- Black-footed ferret (*Mustela nigripes*)
- Canada lynx (*Lynx canadensis*)
- Mexican spotted owl (*Strix occidentalis lucida*)
- Clay reed-mustard (*Schoenocrambe argillacea*)
- Shrubby reed-mustard (*Schoenocrambe suffrutescens*)
- Ute ladies'-tresses (*Spiranthes diluvialis*)
- Uinta Basin hookless cactus (*Sclerocactus glaucus*)
- Bonytail (*Gila elegans*)
- Colorado pikeminnow (*Ptychocheilus lucius*)
- Humpback chub (*Gila cypha*)
- Razorback sucker (*Xyrauchen texanus*)

The action area is defined at 50 CFR 402 to mean “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action”. Federal lands administered by other agencies and State, Tribal, and private lands that adjoin BLM administered land are also considered part of the action area. In general, these are lands immediately adjacent to, downslope from, downstream of, or downwind from BLM-administered land where effects to the watershed, post-fire floods, ash flows, and elevated sedimentation may occur. The Proposed Action area includes the 5,518,800 acres within the boundary of the VFO, of which 1,725,500 acres (approximately 30%) are BLM managed surface lands. Other agencies that manage land in the vicinity of the VFO include the U.S. Forest Service (USFS), Bureau of Indian Affairs (BIA), National Park Service (NPS), USFWS, School and Institutional Trust Lands Administration (SITLA), Utah Division of Wildlife Resources (UDWR), and Utah Division of Lands and Forestry (UDLF). Additional lands are held in private ownership or in trust by the United States for the Ute Indian Tribe or for individual Indians. Much of the Vernal Planning Area (VPA) is located within the boundaries of the Uintah and Ouray Indian Reservation, with Indian Trust Lands managed by the BIA. Therefore, federally listed species and habitat located on these lands

could be indirectly effected by resource management decisions made in the Proposed Action area.

The Diamond Mountain portion of the planning area includes BLM-administered lands and minerals in Daggett and Duchesne Counties and a portion of Uintah County northwest of the Green River. The plan is responsible for the administration of public land in Browns Park and the Diamond Mountain Plateau for the Little Snake Field Office (LSFO) of Colorado. The LSFO administers public land in Browns Park for some resources. Administration of these agreed-upon resources is in accordance with the parent resource area's management plan. There are also fire suppression agreements between the VFO and these other BLM field offices. The Book Cliffs portion of the planning area is located in northeastern Utah. It is bounded by the Utah-Colorado state line on the east, the Book Cliffs Mountain to the south, the Green River to the west, and Blue Mountain to the north. The Book Cliffs area includes public land and minerals in Uintah and Grand Counties. The VFO boundary officially ends at the Uintah County line; however, a small portion of the public lands in Grand County of the Moab Field Office (MFO) is administered by the VFO under a MOU. The agreement with Moab includes the administration of all resources and programs including land use planning, while a similar agreement with the White River Field Office in Colorado includes only grazing administration.

The Vernal RMP describes activities in a number of resource management programs. Several of the aforementioned programs have “no effect” or “not likely to adversely affect” determinations on the following species, however overall, the entire Vernal RMP is a “likely to adversely affect” determination for all the listed species: Mexican spotted owl, black-footed ferret, Canada lynx, Ute ladies'-tresses, shrubby reed-mustard, clay reed-mustard, Uinta Basin hookless cactus, bonytail, Colorado pikeminnow, humpback chub, and razorback sucker.

Table 1. Federally Protected Utah Species on BLM Lands Analyzed in this Biological Opinion (BO) for the Proposed Resource Management Plan by Vernal BLM Field Office. “Likely to adversely affect” determinations (LAA) are used if a program may have any direct or indirect adverse effect to a threatened or endangered species. “May affect, not likely to adversely affect” (NLAA) determinations conclude that activities occurring under the program are either insignificant or beneficial. “No effect” (NE) determinations conclude that the species and critical habitat will be unaffected by the proposed activities under the program.

Programs	Air Quality	Cultural Resources	Paleontological Resources	Fire Management	Lands and Realty Management	Livestock and Grazing	Minerals and Energy	Recreation and Travel	Riparian and Wetland Management	Soil and Water Resources	Special Designations	Special Status Species	Vegetation Management	Visual Resources	Wild Horses	Wildlife and Fisheries	Woodlands and Forests	Wilderness Characteristics
Black-footed ferret (<i>Mustela nigripes</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	NE	LAA	NE	LAA
Canada lynx (<i>Lynx canadensis</i>)	NE	LAL	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	NE	LAA	LAA	LAA
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Shrubby reed-mustard (<i>Schoenocrambe suffrutescens</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Clay reed-mustard (<i>Schoenocrambe argillacea</i>)	NE	LAA	LAA	NLAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAL	LAA	LAA
Uinta Basin hookless cactus (<i>Sclerocactus glaucus</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Bonytail (<i>Gila elegans</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
humpback chub (<i>Gila cypha</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Colorado pikeminnow (<i>Pygocottelus lucius</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA
Razorback sucker (<i>Xyrauchen texanus</i>)	NE	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	LAA	NLAA	NLAA	LAA	NLAA	LAA	LAA	LAA	LAA

Description of Activities and Management Prescriptions under the Vernal RMP

Air Quality

The primary objective of air quality management within the Vernal planning area is to maintain air quality in accordance with standards prescribed by federal and state laws and regulations. The air quality program does not consider potential impacts to fish and wildlife resources beyond the standards set forth by EPA and the Utah Department of Environmental Quality. Air quality management actions include managing air quality in accordance with standards provided by federal, state and local laws and regulations, compliance of the Clean Air Act, mitigation of actions that compromise ambient air quality standards or visibility within the Class I air areas, and compliance with Utah Administrative Code Regulation R307-205, which prohibits the use, maintenance, or construction of roadways and disturbed areas without taking appropriate dust abatement measures. Compliance would be obtained through special stipulations as a requirement on new projects and through the use of dust abatement control techniques in problem areas.

Currently, emission sources within the VPA consist of mostly oil and gas development facilities and mining sites. There are also fugitive dust sources associated with these sites, construction activities and roadways.

Cultural Resources

The objective of the cultural resource management program is to protect, preserve, interpret, and manage significant cultural resources for their informational, educational, recreational, and scientific values. Site-specific inventories for cultural resources are required before the start of surface disturbance or if Vernal Field Office-administered lands were proposed for transfer out of federal ownership.

Cultural resources within the Vernal area are numerous, diverse, and widely dispersed. The resources range from small, ancient artifact scatters associated with prehistoric populations to historical resources like cabins, homesteads, mines, and railroads. Although these resources have been documented over years of study, a comprehensive picture of the exact distribution of the resources is not possible due to the large area encompassed and the lack of region-wide systematic study. Areas likely to have high concentrations of cultural resources include areas nearby permanent water, juniper zones, sand dune areas, and historical mining districts.

Cultural inventories have traditionally been conducted to support site-specific surface-disturbing projects, such as mineral and energy development, to comply with the requirements of Section 106 of the National Historic Preservation Act and other cultural resource preservation laws. During these activities, cultural resources are inventoried, categorized, and preserved; in addition staff will conduct field activities, perform excavations; map and collect surface materials, research records, and photograph sites and cultural resources. Inventory data collection is used for documentation and development of mitigation plans before other resource program surface disturbance. Inventory activities commonly entail the use of hand tools, power tools, or heavy machinery. Survey intensity varies among inventories and may last from one day to several

weeks. In addition, academic institutions have performed research excavations, although such scientific investigations were limited. Intensive cultural resource inventories that meet Utah Class III standards (i.e., 15-meter transect intervals) have been completed on approximately 57,000 acres.

Cultural resource land management may include: reduction of imminent threats and potential conflicts from natural and human-caused deterioration; creation of opportunities for scientific and educational uses of cultural resource sites; interpretation and education focused on previous human occupation and land uses, provision of traditional Native American uses through permits, including collection of herbs, medicines, traditional use items, and items necessary for traditional, religious, or ceremonial purposes. These actions may involve proactive research, protection and inventories involving universities, service groups, site stewards, tribes and community outreach.

Surface disturbance is generally avoided near significant cultural resource sites and within ¼ mile or the visual horizon of significant segments of historic trails and canals. Sites listed on, or eligible for, the National Register for Historic Places are protected and would be managed for their local and national significance in compliance with the National Historic Preservation Act, the Archaeological Resources Protection Act, the American Indians Religious Freedom Act, and the Native American Graves Protection and Repatriation Act, as appropriate.

Paleontological Resources

The objective of the paleontological resource management program is to protect, preserve, interpret, and manage significant cultural resources for their informational, educational, recreational, and scientific values. Site-specific inventories for paleontological resources are required before the start of surface disturbance or if Vernal Field Office-administered lands were proposed for transfer out of federal ownership.

Paleontological resources are abundant in the Vernal Field Office. The Uinta Basin, situated in the central portion of the VPA, has a geologic history of several orogenies (mountain building events) and a series of sea level changes evidenced in the various rock formations and in the fossil record. The rocky outcrops in the VPA are primarily sedimentary and span more than 2.8 billion years of geologic history. These sedimentary deposits include Precambrian marine clastics, Paleozoic shelf deposits, Mesozoic terrestrial deposits, Tertiary basin fill and lake deposits, and Late Tertiary and Quaternary basin fill, glacial deposits, and alluvium. The sedimentary rocks within the VPA formed and deposited in a variety of ancient environments more than 65 million years ago.

During these activities, paleontological resources are inventoried, categorized, and preserved; in addition staff will conduct field activities, perform excavations; map and collect surface materials, research records, and photograph sites and resources. Inventory data collection is used for documentation and development of mitigation plans before other resource program surface disturbance. Inventory activities commonly entail the use of hand tools, power tools, or heavy machinery. Survey intensity varies among inventories and may last from one day to several weeks. In addition, academic institutions have performed research excavations.

Paleontological resource management may further include surface collection of common invertebrate and botanical paleontological resources for non-commercial use, interpretation of paleontological resources, protection of fossil resource sites not feasible or desirable to excavate.

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resource values from wildfire and to restore the natural role of fire in the ecosystem. The major activities involved with the fire management program include: wildfire suppression; management of natural ignitions as wildland fire use for resource benefits; prescribed burning; non-fire fuels treatment for hazardous fuels reduction; and emergency stabilization and rehabilitation following wildfires.

Fires within the planning area are both naturally occurring and used as a management tool. Naturally occurring fires are widely distributed in terms of frequency and severity. In the 10-year period from 1989 to 1998, 497 wildland fires burned a total of 8,540 acres in the VPA. Of these wildland fires, 445 were caused by lightning, and 52 were human-caused ignitions. During the period from 1999 through 2001, 24,294 acres were treated by prescribed burning in a total of nine treatment areas. Plans for the following five years included prescribed burns on approximately 11,000 acres annually.

Wildfires are suppressed when they threaten values and resources, such as wildland urban interface areas, developed recreation sites, areas that are unlikely to recover following fire (i.e., areas of noxious weeds or invasive species), sensitive soils, critical threatened and endangered species habitat, or fires with potential to spread to private, state, or other federal lands. Fire suppression methods vary with the intensity of the wildfire and are conducted on an emergency basis. Firelines may be constructed by hand or by heavy equipment to contain the wildfire. Water may be withdrawn from nearby sources to suppress fires. Chemical fire suppression agents and retardants may be used, if necessary. The use of aerial fire retardant is restricted near water resources. After a fire is extinguished, emergency stabilization and rehabilitation techniques, such as seeding and soil stabilization actions, may be used restore a burned or suppressed area to its previous vegetation cover. These suppression and post-suppression activities often employ the use of off-road vehicles, hand tools, and heavy equipment such as bulldozers.

Wildland fire use fires are implemented in areas that would benefit from the reintroduction of fire. Some suppression techniques, as described above, may be used to keep the fire within pre-determined boundaries, but no emergency stabilization and rehabilitation actions are taken following wildland fire use.

Prescribed fire and non-fire fuels treatment objectives are to restore natural fire regimes, reduce hazardous fuel loading, and enhance resources, such as wildlife habitat. Prescribed fires follow a pre-determined prescription and include activities such as broadcast burning or pile burning following manual or mechanical fuel treatments. Non-fire fuel treatment actions include: tree thinning or clear-cutting (i.e., juniper) by hand or using mechanized equipment, chemical application of herbicides to reduce shrub cover, disking to remove vegetation and prepare the soil for seeding, and seeding of native and/or non-native species to prevent increase of invasive species.

Lands and Realty Management

The objectives of the lands and realty management program are to support multiple-use management goals of other BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs.

Public land tracts that are not critical to current management objectives may be disposed of through the realty management program (reviewed on a case-by-case basis). Non-federal lands may be acquired through exchange in areas with potential for recreation development or in areas containing important wildlife, cultural, scenic, natural, open space, or other resource values. Protective withdrawals may be established to protect and preserve important resource values, but require extensive mineral investigations.

Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or in perpetuity. BLM also pursues access across private lands, rehabilitates access roads that are no longer needed, and proposes easement negotiations.

The program pursues cooperative agreements, develops recreation site facilities, considers offsite mitigation, minimizes access in wildlife habitat, fences revegetation sites, blocks linear rights-of-way to vehicle use, considers temporary-use permits, considers new withdrawals, and identifies parcels for landfills under the Recreation & Public Purposes Act. Areas with important resource values will be avoided where possible when planning routes and installation of new facilities. Effects will be mitigated if it becomes necessary to place facilities within avoidance areas.

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base, while improving wildlife habitat and watershed condition and meeting Utah's Rangeland Health Standards.

Not all BLM lands are open to livestock grazing due to conflicts with other resource uses. Range management activities may include vegetation treatments such as prescribed fire or mechanical and chemical control of noxious weeds, sagebrush, and other target species. Salt or mineral supplements may be approved to help manage livestock distribution. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management).

The 160 allotments within the VPA designated for livestock grazing encompass approximately 1,691,116 acres of BLM land. An additional 545,887 acres of other lands (private, state, tribal, etc.) are included within these allotments. Livestock are regularly permitted to graze on 153 of the 160 allotments as follows: cattle (113), sheep (27), sheep and cattle (12), and horses (1). A few of the cattle and/or sheep allotments also permit some horses. Forty-five of the 153

allotments are currently grazed under a deferment rotation system, which involves delaying grazing in an allotment until the seed maturity of the key forage species. On the remaining 7 allotments (Red Creek Flat, Rye Grass, Marshall Draw, Taylor Flat, Warren Draw South, Watson-Diamond Mountain and Sears Canyon), cattle are permitted on a temporary, non-renewable basis; however, such use is discretionary. Within the VPA, under the Proposed Plan, 146,161 animal unit months (AUMs) are located for livestock, but active permitted use for the 160 allotments is currently 137,897 AUMs. However, the demand for forage resources by livestock (the total average actual use) for the past 10 years was only 78,500 AUMs. Suspended use for the 160 allotments is currently 26,364 AUMs. This information was compiled from the Actual Use records of each livestock operator. When actual use was not available, licensed-use figures were used.

Livestock grazing management includes using an interdisciplinary allotment evaluation to provide specific guidance and actions, allocation of long-term increases or decreases in forage on a case-by-case basis, analyzed through the NEPA process, use of livestock grazing to enhance ecosystem health and help accomplish resource objectives. Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities. These projects are designed and constructed to implement grazing systems that are designed to meet Rangeland Health Standards and improve watersheds conditions, wildlife habitat, riparian proper functioning conditions, and forage production.

Minerals and Energy Resource Management

Objectives of the minerals and energy program are to provide opportunities for mineral exploration, development and reclamation under leasing laws subject to legal requirements to protection other resources. Mineral development is subject to leasing, location, or sale based on the Federal mineral law covering that particular commodity. The planning area will be open to consideration for exploration, leasing, and development of leasable minerals including oil, gas, coal, oil shale, phosphates and geothermal. The minerals program is divided into the three categories of salable, leasable, or locatable minerals.

Salable Minerals

Salable minerals include sand, gravel, and common varieties of building stone. Before issuing contracts or free use permits for salable minerals, appropriate environmental analyses are conducted, including special studies or inventories of cultural resource values, threatened or endangered plant and wildlife species, and other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resources and reclamation of the land following project completion. Site reclamation is required following any surface-disturbing activity by mining for salable minerals. Reclamation includes removing surface debris, recontouring, reducing steep slopes, and planting vegetation. All reclamation proposals must conform to federal and state agency requirements.

Leasable Minerals

Leasable minerals include fluid (oil, gas, geothermal) and solid minerals such as coal, gilsonite, phosphate, tar sand, oil shale and associated minerals. Oil and gas development are major

resource development activities within the Uinta Basin, and intense oil and gas exploration and development are expected on BLM administered lands within the VPA over the planning period of the proposed RMP. In Utah, coal is generally extracted using underground mining methods although surface coal mine operations and methods are likely to be proposed for some future operations. Surface facilities include truck/train loadouts, offices, maintenance facilities, change house, electrical substations, and roads. Total surface disturbance is usually less than 20 acres.

Surface coal and phosphate mining involves the use of draglines, shovels, and haul trucks and results in large areas of surface disturbance from road construction; topsoil and overburden removal; and stock piling of these materials. Reclamation includes recontouring as closely to the original landscape as possible, reconstruction of drainages, reseeding, and monitoring.

Fluid leasable minerals include oil, gas, and geothermal steam. In areas where development of oil and gas resources would conflict with the protection or management of other resources or public land uses, mitigation measures are identified and may appear on the leases as either stipulations to uses, or as restrictions on surface occupancy. Once the parcel is sold, it matures into a lease and is authorized for a 10 year period. Planning period estimates include approximately 2,055 new oil wells, 4,345 new gas wells, and 130 new CBM wells would be drilled during the planning period. The majority of the oil and gas development activity is anticipated to occur in the Monument Butte-Red Wash exploration and development area. Most CBM activity is expected to occur in the East and West Tavaputs Plateau areas.

Initial geophysical exploration involves use of vehicles to lay the geophones and drill the shot holes for charges, or "thumpers" to create the sound waves. Exploration for oil and coal bed natural gas may also include drilling more than one well. Surface disturbance during the exploration phase of drilling includes the construction of roads, well pads, reserve pits, and other facilities.

Development of oil and gas fields includes construction pads, storage tanks, storage tank batteries, oil and gas processing facilities and necessary pipeline, compressor engines and power lines right-of-ways. Generally, each drill site includes a 3 acre pad, 1 mile of road, and 1 mile of pipeline. Directional drilling requires a larger pad size and is dependent on the number of wells drilled from each pad.

Methods to dispose of residual water from oil and gas production include: subsurface re-injection, direct surface discharge, and discharge into a containment pond or pit. Chemically polluted water may be treated before surface discharge or may be reinjected. Geothermal resources are available for exploration, development, and production and are subject to the same surface disturbance restrictions and other stipulations applied to oil and gas exploration, development, and production.

Locatable Minerals

Locatable metallic minerals include gold, gypsum, uranium and other precious and base minerals. Minerals that are normally locatable may be leasable on acquired lands.

Minerals are locatable under the 1872 Mining Law. Most public lands are open to location with the exception of withdrawn lands. The Mining Law of 1872 sets the requirements for lode

claims, placer claims, and mill sites as well as discovery, location, annual filings, assessment work, and mineral examinations to establish validity. Mining law allows for individuals and corporations to prospect for minerals on public domain lands, and upon making a discovery, to stake (or “locate”) a claim on that deposit. A claim gives the holder the right to develop the minerals and may be “patented” to convey full title to the claimant. This law is under constant scrutiny, and a continuing issue is whether this law should be reformed, and if so, how to balance mineral development with competing land uses. Since October 1, 1994, Congress has imposed a budget moratorium on BLM acceptance of any new mineral patent applications. Until the moratorium is lifted, the BLM will not accept any new applications.

Surface disturbance for uranium extraction includes processing plants, equipment maintenance buildings and offices, or other various extraction support facilities disturbing approximately 5-15 acres. Potential impacts of locatable mineral developments include increased soil erosion resulting in increased sedimentation, some potential for release or exposure to toxic chemicals and wastes, individual mortality, localized population mortality, habitat loss/fragmentation, and reduction of reproductive success.

Recreation and Travel Management

The objective of recreation resources management is to identify recreation values and resources on public lands and make decisions which will ensure that these values are maintained on a long-term sustained yield basis to meet the recreational needs of the using public. Recreation management includes allowing recreational access by the public, developing and maintaining recreation areas and facilities, issuing special recreation permits for organized groups, competitive events and commercial outfitters and guides, acquiring recreational access, accommodating a variety of uses and minimizes user conflicts, coordination of OHV management, providing information to the public about BLM’s recreation resources and assessing effects of recreational use to the environment. The BLM monitors recreational use, develops management plans, and evaluates recreational potential.

Through the resource management planning process BLM identifies and designates special recreation management areas. These include areas which require greater recreation investment, where more intensive recreation management is needed and recreation is a principal management objective. Recreational activities in the project area may include OHV use, camping, hiking, rappelling, photography, wildlife & scenery viewing, horseback riding, hunting, and mountain biking. OHV areas are designated as open, limited, or closed. An open designation allows intensive OHV use where there are no compelling resource protection needs, user conflicts, or public safety issues. An area designated as limited restricts OHV use to meet specific resource management objectives. Limitations may occur on number or type of vehicles, time and season of use, or specific roads. An area is designated as closed to protect resources, ensure visitor safety, or reduce user conflicts. Within the VPA there are 787,859 acres open to OHV use, 887,275 acres that are limited, and 50,388 acres that are closed.

Riparian and Wetland Resources

The objective of riparian area management in Utah is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order

to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses. Priority for riparian area management will be given to areas identified as habitat for aquatic species with signed Conservation Agreements and Strategies. Laws and guidelines followed during riparian management include BLM Manual 1737 – Riparian-Wetland Area Management, Riparian-Wetland Initiative, Executive Orders 11990 (wetland) and 11988 (floodplain), Utah BLM Riparian Management Policy issued through BLM Utah State Office Instruction Memorandum No. UT 2005-091, and section 404 of the Clean Water Act.

Riparian area management is an integral part of all resources and related management programs. Management actions may include reductions in livestock numbers, adjustments in grazing distribution patterns, fencing, herding, livestock conversions, vegetation treatments, monitoring, and recontouring streambanks. In addition, restrictions are placed on other resource programs that are meant to protect riparian areas including development restrictions on time, space, and placement, and appropriate buffers. Those activities that affect or are affected by riparian values will account for the riparian areas management objectives and direction. Resource values and uses that affect or are affected by riparian values include wildlife and fisheries habitat, forest resources, livestock grazing, OHV use, visual resources, cultural and historical resources, minerals exploration and development, lands and realty activities, watershed and soils resources, recreation uses, fire management, and access.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Best Management Practices (BMPs) are incorporated into project level documents and are designed to reduce sedimentation and protect water quality. BMPs are also designed to benefit soil productivity by minimizing erosion. Examples of soil protection measures implemented under this program include seasonal or weather restrictions for use of heavy equipment on moist soils or slope limitations for mechanical harvest equipment. Soil protection measures are often identified in site-specific environmental analyses. Examples of water quality protection measures include identification of heavy sediment loads, monitoring and treating soil erosion, evaluating and restricting surface development, and monitoring water quality. Watershed management activities include some of these same activities through the evaluation of projects, application of seasonal closures, monitoring of public drinking water, and completion of groundwater studies. Some of the field activities involve the use of heavy machinery and hand tools to develop riparian/wetland exclosures and stream improvements. Management of water resources may include the imposition of restrictions on activities such as development, in order to maintain water, and watershed quality. Generally, the program provides information in support of other resource objectives and goals.

Special Designation Areas

The following describes special designation areas, including Areas of Critical Environmental Concern (ACEC); Wild and Scenic Rivers (WSR); and Wilderness Study Areas (WSAs).

Areas of Critical Environmental Concern (ACEC) - An ACEC is the principal BLM designation for public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards. The VFO manages seven ACECs (165,944 total acres) that were designated in 1994 in the Record of Decision (ROD) for the Diamond Mountain RMP (BLM 1994a). They are, in order of decreasing size, Browns Park, Nine Mile Canyon, Red Mountain-Dry Fork, Red Creek Watershed, Pariette Wetlands, Lower Green River Corridor, and Lears Canyon.

Wild and Scenic Rivers - Congress designates rivers into the National Wild and Scenic Rivers system. These can include scenic, wildlife, fish, cultural and recreational values among others. Eligible/suitable rivers are given a tentative classification of wild, scenic, or recreational based upon the amount of disturbance within the river corridor. Both congressionally designated rivers and eligible/suitable segments are managed to protect the free-flowing nature of the river, the tentative classification, and the outstandingly remarkable values. Currently no wild and scenic rivers have been designated within the decision area. As part of the wild and scenic river review process, The Upper Green and Lower Green segments of the Green River were found suitable for congressional designation in the ROD for the Diamond Mountain RMP, and are currently managed to protect their free-flowing nature, outstandingly remarkable values, and tentative classifications.

Wilderness Study Areas (WSAs) - WSAs are roadless, natural, provide outstanding opportunities for solitude or primitive and unconfined recreation, and may have supplemental values (such as ecological, geological, or other features of scientific, educational, scenic, or historical value). In general this means that there can be no new permanent structures or new disturbance that would require reclamation in order for the area to appear natural. The lands are closed to mineral leasing. With very few exceptions, there can be no new permanent structures or new disturbance, and no motorized or mechanized transport. The lands are closed to mineral leasing and mineral location under the mining laws. There are six WSAs in the planning area for a total of 52,978 acres. Management actions in WSA's include designating open routes for motorized uses if it will not impair the area's wilderness suitability, or in this case, the BLM would take appropriate steps including use of restrictions or closures, installation of additional signs and barricades, and restoration of affected areas.

Special Status Species Management

Objectives of the special status species program include maintenance of biological diversity of plant and animal (terrestrial and aquatic) species by supporting the State Division of Wildlife Resources' strategic plans for wildlife population objectives to the extent practical and consistent with BLM multiple-use management requirements. Other objectives include the development of protective measures for federally listed species and other special status species; cooperations with other agencies in managing listed species; facilitation of scientific research of special status species and their habitats, and to the extent possible, avoidance of habitat fragmentation.

In addition, BLM's special status species management program often includes the enforcement of timing restrictions, completion of surveys, and development of conservation measures and best management practices for the mitigation of effects of development deemed to be discretionary actions of the BLM. Activities implemented under this program may include identification and enforcement of timing stipulations; completion of species surveys; implementation of Recovery Plans; implementation of Conservation Agreement and Strategy decisions to increase populations and improve habitat of special status species; and closure of areas containing sensitive species populations or habitat.

Vegetation Management

Objectives of the vegetation resource management program are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Primary goals of the vegetation management program are to monitor and improve riparian habitats, and rehabilitate functioning at-risk and non-functioning areas.

Vegetation treatments, (e.g., timber harvest and sagebrush spraying, burning, chaining) will be designed to meet overall resource management objectives, which include the protection of listed plant and animal species. Control methods include chemical, biological, and mechanical, and cultural practices. Biological control can involve the use of weevils, beetles, or goats.

Mechanical methods include dozing, cutting, chopping, and pulling. Cultural controls include education and public awareness campaigns, use of weed free forage, and changes in grazing practices to increase health and vigor of plant communities so that they are more resistant to invasion. Depending on the site and circumstances, these methods can be used individually or in combination. Fire is used to improve range forage production, wildlife habitat, timber stands, sale debris disposal, and to reduce hazardous fuel buildup. Seed collection, scientific collection, and collection by Native Americans for traditional use is also approved under this program.

Visual Resource Management

The objective of visual resource management (VRM) is to manage public lands in a manner that will protect the quality of the scenic (visual) values of the landscape. To accomplish this objective, BLM establishes visual resource management priorities while giving consideration to other resource values and uses. Visual resources are managed in accordance with objective classes that have been assigned to all public lands in each Field Office.

To meet VRM objectives, the BLM designs facilities, such as power lines, oil and gas wells, wildlife guzzlers, and storage tanks to fit with their surroundings. Design considerations include location (e.g., screening or distance), color (painting), building materials, size and scale, and reclamation.

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Management includes maintaining viable herds that will

preserve the free-roaming nature of wild horses in a manner that is designed to achieve and maintain thriving ecological balance on the public lands.

Currently, there are two designated Herd Management Areas (HMAs): Bonanza and Hill Creek. Currently all animals have been removed from the Bonanza HMA. There are also wild horses in the Winter Ridge Herd Area. The proposed action calls for all horses to be removed from the planning area. Therefore, the main impacts to these areas will be from 1) the effects of grazing and 2) the effect of the herd gathering and removal. Herd gathering is generally accomplished by setting up temporary ground traps and metal paneling and using people, vehicles and helicopters to haze the animals into the traps.

Wildlife and Fisheries Management

The BLM works closely with the UDWR to manage habitat for fish and wildlife (including big game, upland game, waterfowl, neo-tropical migratory birds, small mammals, amphibians, and reptiles) to achieve and maintain suitable habitat for desired population levels and distribution within the decision area. The UDWR is responsible for managing wildlife population levels; the BLM is responsible for managing wildlife and fisheries habitat in a condition that will support desired levels of species. The BLM works cooperatively with the UDWR to maintain and reestablish populations of native species that have used the historic range located within the planning area through habitat management and restoration.

Objectives of the fish and wildlife resource management program include maintenance of habitat quantity, quality, and connectivity to sustain diverse wildlife populations; maintenance and improvement of aquatic habitats to sustain diverse fisheries and aquatic populations; and conservation of migratory bird habitat as directed by Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) and the Migratory Bird Treaty Act and emphasize management of migratory birds listed on the USFWS current list of Birds of Conservation Concern and the Partners-in-Flight priority species. Fish and wildlife management actions may include surveying; habitat monitoring; habitat and species inventories, habitat improvement, habitat restoration, water developments, riparian habitat improvements, etc., as well as development of habitat management plans.

The BLM develops stipulations and conservation measures to both protect and enhance wildlife and fisheries habitats. These stipulations and conservation measures may include such things as: recommending withdrawal of some areas from mineral entry; limiting access to specific areas by OHVs and pedestrians; and minimizing the impacts of surface development. The BLM may acquire crucial wildlife habitats or easements and conduct inventories of potential habitats for occurrences of threatened, endangered, and sensitive species or their habitat.

Woodland and Forestry Management

Forest management objectives are to maintain and enhance the health, productivity, sustainability, and biological diversity of forest and woodland ecosystems and to provide a balance of natural resource benefits and uses, including opportunities for commercial and non-commercial harvest of forest and woodland products on a sustainable basis. Forests are managed for multiple uses, such as recreation, livestock grazing, and wildlife habitat. The forest management program also implements silviculture practices including site preparation,

regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest.

The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal of tree stands. Herbicides may be used to control grasses and shrubs. The program also ensures that timber harvest systems will be designed to avoid or minimize impacts to soils and can include tractor yarding, cable yarding, and helicopter logging. Seasonal harvest restrictions will be implemented to avoid soil damage during wet periods; and to avoid nesting periods of special status species. Slash treatments include lop and scatter, handpiling, and burning. Regeneration areas may be fenced to prevent wildlife and livestock from damaging seedlings. Forest management actions may include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Private and state land may be accessed for forest management purposes through easement acquisitions. Non-timber forest products are harvested and sold by permit. Non-timber forest products include firewood, posts, poles, Christmas trees, and wildings.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

These areas exist in a natural or undisturbed condition and provide outstanding opportunities for solitude or primitive forms of recreation (non-motorized and non-mechanized activities in undeveloped settings). There are nine areas in the VPA (approximately 102,938 acres) outside of existing WSAs that were determined by BLM in the 1999 inventory to have the wilderness characteristics of size, naturalness, and outstanding opportunities for solitude or primitive recreation. Non-WSA lands with wilderness characteristics would be managed as VRM Class II, OHV use would be limited to designated routes, and would be closed to oil and gas leasing and woodland product harvest. In addition, these areas would be closed to new minerals developments and ROWs, new water developments would be created for wildlife and have to meet VRM Class I objectives, and fires suppression would be permitted but surface disturbances would be rehabilitated following completion.

Conservation Measures

As part of the proposed action, in order to minimize the effects of the above management programs, the Vernal BLM Field Office has committed to a variety of species-specific conservation measures and, in conjunction with USFWS, developed species-specific lease notices for leases permitted under the Minerals and Energy Program. For a complete listing of the BLM committed conservation measures, lease notices, and Best Management Practices (BMPs), please refer to Appendix A.

SPECIES ACCOUNTS, EFFECTS, AND CONCLUSIONS

The following section includes species-specific information pertaining to the status and distribution of each species, the environmental baseline, and programmatic-level effects of the proposed action.

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed State or Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process.

"Effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline. Direct effects encompass the immediate, often obvious effect of the proposed action on a species or its habitat. Indirect effects are caused by, or result from the proposed action, are later in time, and are reasonably certain to occur. In contrast to direct effects, indirect effects may be more subtle, and may affect species' populations and habitat quality over an extended period of time, long after RMP activities have been completed.

Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Mexican spotted owl (*Strix occidentalis lucida*)

Status of the Species

Species / Critical Habitat Description

The Mexican spotted owl (*Strix occidentalis lucida*) is one of three subspecies of spotted owl recognized by the American Ornithologists' Union (AOU 1957:285). The other two subspecies are the northern (*S. o. caurina*) and the California spotted owl (*S. o. occidentalis*). The Mexican subspecies is geographically isolated from both the California and northern subspecies.

The spotted owl is mottled in appearance with irregular white and brown spots on its abdomen, back and head. Several thin white bands mark an otherwise brown tail. The spots of the Mexican spotted owl are larger and more numerous than in the other two subspecies, giving it a lighter appearance. *Strix occidentalis* translates as "owl of the west"; *lucida* means "light" or "bright." Unlike most owls, spotted owls have dark eyes.

Adult male and female spotted owls have similar plumage. However, the sexes can be identified by voice and size differentiation. Juveniles, subadults, and adults can be distinguished by plumage characteristics (Forsman 1981; Moen et al. 1991). Juvenile spotted owls (hatchling to approximately five months) have a downy appearance. Subadults (5 to 26 months) have pointed

rectrices with white tips (Forsman 1981, Moen et al. 1991). Rectrices of adult (>27 months) feathers have rounded, mottled tips.

Although the spotted owl is often referred to as a medium-sized owl, it ranks among the largest owls in North America. Of the 19 species of owls that occur in North America, only 4 are larger than the spotted owl (Johnsgard 1988). As a species, the spotted owl averages 41-48 cm (16-19 inches) long (Earhart and Johnson 1970), 107-114 cm (42-45 inches) across the spread wings (Walker 1974), and weighs 547-647 grams (19.5-23 ounces). These measures are expressed as ranges because, similar to other owl species, spotted owls exhibit reversed sexual dimorphism (i.e., females are larger than males).

Life History and Population Dynamics

Spotted owls have one of the lowest clutch sizes among North American owls (Johnsgard 1988); females lay one to three eggs, two being the most common. Mexican spotted owls breed sporadically and do not nest every year (Ganey 1988). In good years, most of the population will nest, whereas in other years only a small proportion of pairs will nest successfully (Fletcher and Hollis 1994).

Courtship begins in March and eggs are laid in late March or, more typically, early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female. Female spotted owls generally incubate for approximately 30 days. During incubation, the female leaves the nest only to defecate, regurgitate pellets, or receive prey delivered by the male, who does most or all of the foraging. The eggs usually hatch in early May (Ganey 1988). Females brood their young almost constantly, leaving their nests for only brief periods during the night. Nestling owls fledge from four to five weeks after hatching, from early to mid-June in most cases (Ganey 1988). Owlets often leave the nest before they can fly, simply jumping from the nest onto surrounding tree branches or the ground. Within a week after leaving the nest, most owlets can make short, clumsy flights. Three weeks after leaving the nest owlets can hold and tear up prey on their own, and by late July most have become proficient at pouncing on crawling insects (Forsman et al. 1984). The young depend on their parents for food during the summer and will eventually disperse out of the natal area in the fall. Reproductive output varies both spatially and temporally (White et al. 1995), but may be higher than the California and the Northern spotted owl (Verner et al. 1992, Thomas et al. 1993).

Forsman et al. (1976) described spotted owls as "perch and pounce" predators. They typically locate prey from an elevated perch by sight or sound, then pounce on the prey and capture it with their talons. Spotted owls have also been observed capturing flying prey such as birds and insects (Verner et al. 1992). Specific prey groups include: woodrats, mice, voles, rabbits, gophers, bats, birds, reptiles, and arthropods. Spotted owls dwelling in canyons of the Colorado Plateau take more woodrats, and fewer birds, than do spotted owls from other areas.

Mortality factors include predation, starvation, and accidents. Little is known about how disease and parasites contribute to mortality of spotted owls. Avian predators include great horned owls, northern goshawks, red-tailed hawks, and golden eagles. The extent of predation is unknown; however both juveniles and adults are preyed upon (Willey 1993). Starvation may result from low abundance or availability of prey. Most instances of starvation occurred from late fall

through winter when prey resources were reduced in abundance and availability (Willey 1993, Block and Ganey, unpub. data). Starvation may also predispose individuals to increased predation. Little data is available on frequency of accidents, and subsequent mortality. Instances of spotted owls being hit by cars have been documented. Owls may also collide with power lines or other obstacles (USFWS 1995).

Based on limited study information, annual survival rates of adult Mexican spotted owls is 0.8-0.9 and juvenile survival is 0.06-0.29 (USFWS 1995). Survival estimates may be biased low, but conclude higher survival of adults than juveniles. Available data is either insufficient or has not been analyzed to estimate population trends.

Status and Distribution

The Mexican spotted owl (*Strix occidentalis lucida*) was listed as a threatened species on March 16, 1993 (58 FR 14248). The primary threats to the species were cited as even-aged timber harvest and catastrophic wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the Mexican spotted owl population. The Fish and Wildlife Service appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USFWS 1995).

On August 31, 2004, the Service designated approximately 8.6 million acres of critical habitat for the Mexican spotted owl in Arizona, Colorado, New Mexico, and Utah, on Federal lands (69 FR 53181). There are approximately 47,700 acres of designated critical habitat in the decision area on the western boundary adjacent to Zion National Park and southeast of the town of Tropic. However, not all of these acres contain the primary constituent characteristics essential to the conservation of the species. Some of the primary constituent elements for the Mexican spotted owl include: (1) cooler and often more humid conditions than the surrounding area, (2) clumps or stringers of trees and/or canyon walls with crevices, ledges or caves, (3) high percent of ground litter and woody debris, and (4) riparian or woody vegetation. The primary constituent elements related to forest structure include (1) a range of tree species, (2) a shade canopy created by the tree branches covering 40 percent or more of the ground, and (3) large dead trees with a trunk diameter of at least 12 inches (69 Federal Register 53181-5398).

The primary constituent elements of the critical habitat designation include those physical and biological features that support nesting, roosting, and foraging. Vegetation communities and structural attributes used by the owl vary across the range of the subspecies, but consist primarily of mixed conifer forests or canyons. The mixed-conifer, pine-oak communities and canyon habitat appear to be the most frequently used communities throughout most portions of the subspecies' range (Skaggs and Raitt 1988; Ganey and Balda 1989, 1994; Gutierrez and Rinkevich 1991; USFWS 1995). In Utah, owls utilize canyon habitats (Willey 1998).

Primary constituent elements related to critical habitat in Utah include one or more of the following: (1) presence of water (often providing cooler temperatures and higher humidity than the surrounding areas); (2) clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation; (3) canyon walls containing crevices, ledges, or caves; and (4) high percent of ground litter and woody debris. The primary constituent elements provide a qualitative

description of those physical and biological features necessary to ensure the conservation of the owl in Utah (69 FR 53181).

Although the Mexican spotted owl's entire range covers a broad area of the southwestern United States and Mexico, the Mexican spotted owl does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older uneven-aged forests but also is known to inhabit a physically diverse landscape in the southwestern United States and Mexico. Owls can be found in forested mountains and canyons from southern Utah and Colorado to the mountains of Arizona, New Mexico, western Texas, and into the mountains of northern and central Mexico.

Steep-walled rocky canyonlands provide typical owl habitat within the Utah portion of the Colorado Plateau Recovery Unit. Canyon habitat is used by owls for nesting, roosting, and foraging and includes landscapes dominated by vertical walled rocky cliffs within complex watersheds, including many tributary side canyons. Rock walls must include caves, ledges, and fracture zones that provide protection for nesting and roosting sites. Breeding sites are located below canyon rims; however, it is known that owls use areas outside of the canyons (i.e., rims and mesa tops). Owls nest and roost primarily on cliff faces using protected caves and ledges, and forage in canyon bottoms, on cliff faces and benches, and along canyon rims and adjacent lands. Although it is difficult to rely upon vegetation alone to identify canyon habitat, these areas frequently contain small clumps or stringers of mixed-conifer, ponderosa pine, pine-oak, pinyon-juniper, and/or riparian vegetation (69 FR 53181). Little is known about patterns of habitat use by foraging owls. Willey (1998) documented owl use in Utah to include canyon bottoms and adjacent rims.

Colorado Plateau canyon habitats in Utah are naturally discontinuous and may explain the patchy locations of owls in the region. A study conducted in Zion National Park found owls nesting and roosting in humid, narrow canyons with dense understories (Rinkevich 1991). These canyons provide large cliffs with escape cover to avoid predation, shaded roost sites to avoid high summer temperatures, patches of forest vegetation, and availability of suitable prey.

Historic population size estimates and range of the Mexican spotted owl are unknown; however present population size and distribution are thought to be similar (USFWS 1995). Ninety-one percent of known owls in 1990-1993 occurred on U.S. Forest Service lands, primarily in Arizona and New Mexico. It is unknown why there are fewer owls in Utah and Colorado, but that may be a function of habitat type. Total range wide population estimates are 1,176 to 2,352 owls (69FR 53181, August 31, 2004). Seamans et al. 1999 reported 10 percent or greater population declines and low survival rates in central Arizona and west-central New Mexico. Gutierrez et al. (2003) documented that the decline in New Mexico was continuing, whereas the decline in Arizona appeared to have stabilized. Wide population fluctuations may be common for Mexican spotted owls (Gutierrez et al. 2003).

Environmental Baseline

Status of the Species within the Action Area

Dr. David Willey and Dan Spotskey modeled Mexican spotted owl habitat based on vegetation type, slope, elevation, aspect, and other factors in 1997 and 2000 (Willey and Spotskey 1997, 2000). Both the 1997 model and the 2000 model are used within Utah to identify potential habitat. Any projects that occur within the modeled potential habitat should be verified for actual habitat suitability and, if appropriate, surveys according to protocol should be conducted to determine if Mexican spotted owls occupy the area. The Mexican spotted owl occurs in the eastern and southern thirds of Utah, including Garfield and Kane counties (UDWR 2003).

The Mexican Spotted Owl Recovery Plan was finalized in 1995. Six Recovery Units in the United States were identified based on similarities, or obvious dividing lines, between the following: physiographic provinces, biotic regimes, perceived threats to habitat or individual birds, administrative boundaries, and owl distribution. Suitable habitat and designated critical habitat on public lands managed by the BLM in Utah are within the Colorado Plateau Recovery Unit (USFWS 1995). Five critical habitat units have been delineated in Utah, including the following units which are located in or adjacent to the planning area:

Unit CP-11. This unit is located in Iron, Washington, and Kane Counties in southwest Utah, approximately 22 mi (35 km) northeast of St. George. About half of the unit is on BLM owned lands; Zion National Park is the other land owner.

Unit CP-12. This Unit is in the vicinity of the Kaiparowits Plateau and the Cockscomb, in Kane and Garfield Counties. This unit is primarily on the Grand Staircase-Escalante National Monument, which is owned and managed by the BLM. The other land owner is the Forest Service (Dixie National Forest).

Unit CP-13. This unit occurs in Wayne, Garfield, Kane, and San Juan Counties, Utah. It is primarily in the Waterpocket Fold landform extending to Lake Powell. The primary land owner in this Unit is the National Park Service (Capitol Reef National Park and Glen Canyon National Recreation Area). The BLM owns and manages lands within this unit primarily on the Grand Staircase-Escalante National Monument and along the eastern edge of the Unit. The Forest Service (Fishlake National Forest) also owns land, but to a much lesser extent.

Unit CP-14. This Unit lies in Wayne, Garfield, San Juan, and Grand Counties, Utah. It includes the Dark Canyon Primitive and Wilderness areas of the BLM and FS, respectively. This Unit has lands owned and managed by the National Park Service (Canyonlands National Park and Glen Canyon National Recreation Area), the BLM, and the Forest Service (Manti La-Sal National Forest).

Unit CP-15. This unit is located approximately 30 mi (48 km) east of Price, in Carbon and Emery Counties. Situated in the West Tavaputs Plateau, it is located largely along the Desolation Canyon area of the Green River. The BLM is the primary owner and manager of land within this unit.

It is important to note that critical habitat is not the only suitable or occupied habitat available for owls. Critical habitat is only a regulatory delineation of habitat meeting primary constituent elements, and was defined based on known localities of nest sites (Protected Activity Centers (PACs)) at the time of designation. No PACs or designated critical habitat exists within the VPA.

Factors Affecting Species Environment within the Action Area

Threats to this species and its habitat include recreation, grazing, oil and gas exploration and development, and road improvement and development within canyons; loss, fragmentation, or modification of habitat from catastrophic fire and timber harvest within upland forests potentially used for foraging, dispersal, and wintering; and increased predation associated with habitat fragmentation (USFWS 1995).

Effects of the Action

Cultural Resources Management

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities occurring under this program may increase human presence; equipment and vehicle use; and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of spotted owls during breeding, nesting, roosting, or foraging efforts. Vegetation disturbances or removal associated with cultural resources excavations may reduce availability of prey habitat and prey abundance, at least in the short term. As a result, there may be site-specific decreases in nest initiation or nesting success, and displacement. These effects are likely to be short-term and relatively small scale due to the type of activity.

Paleontological Resources Management

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities occurring under this program may increase human presence; equipment and vehicle use; and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of spotted owls during breeding, nesting, roosting, or foraging efforts. Vegetation disturbances or removal associated with cultural resources excavations may reduce availability of prey habitat and prey abundance, at least in the short term. As a result, there may be site-specific decreases in nest initiation or nesting success, and displacement. These effects are likely to be short-term and relatively small scale due to the type of activity.

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resources values from wildfire and restore the natural role of fire in the ecosystem. Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation treatment or disturbance; and surface disturbance; and decrease local air quality in Mexican spotted owl habitats. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, roosting, or foraging activities. Vegetation disturbances or vegetation removal may decrease prey habitat and prey abundance. Soil disturbances and increased erosion may indirectly decrease abundance of prey. Localized effects from smoke may adversely affect owlets or displace owls. As a result of these impacts, there may be site-specific decreases in nest initiation or nesting success, increased potential for displacement, and increased owlet and adult mortality.

Potential impacts from wildland fire use and prescribed fire would be similar to those from wildfire suppression. Non-fire fuels treatments and emergency stabilization and rehabilitation following wildfires may be used to retain or improve range conditions and maintain lower fuel loads in grassland and sagebrush habitats. Negative short term impacts include harassment or displacement; or immediate post-project alteration of key prey habitat components from surface disturbance. Fire management activities could benefit prey populations of Mexican spotted owls in the long-term due to improved forage quality and quantity.

Lands and Realty Management

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation disturbance; and surface disturbance in Mexican spotted owl habitat. Associated noise and visual disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Construction of power lines or other infrastructure may result in electrocutions, entanglements, or collisions with flying birds, resulting in possible mortality. Vegetation disturbances or vegetation removal may adversely affect availability of prey habitat. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey habitat. Increased occurrence of invasive plants species may change the vegetation community and change the habitat for Mexican spotted owl prey species. Exchange

or sales of lands may lead to habitat fragmentation and loss. As a result, there may be decreases in nest initiation or nesting success, and decreased adult and owl fitness.

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder wildlife species: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation disturbance; and minor surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances, vegetation removal, or vegetation alteration may result in less dense vegetation, more invasive plant species, fragmented prey habitat and adverse affects to availability of prey habitat and prey abundance. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey habitat. As a result, there may be decreases in nest initiation or nesting success, and increased adult and owl mortality.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

These occurrences may increase human presence; equipment and vehicle use; vegetation disturbance or removal; soil disturbances; invasive plant species; and pollutants in Mexican spotted owl habitat. Associated noise and visual disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances or vegetation removal may adversely affect availability of quality and quantity of

prey habitat. Soil disturbances may increase erosion, adversely affect soil stability, and decrease prey habitat. Some ancillary equipment associated with energy development (e.g., transmission lines, oil pits) may result in direct mortality of owls if they become impinged on the lines or caught in the pits. Increased occurrence of invasive plants species may change the vegetation community and change the habitat for Mexican spotted owl prey species. Pollutants in the area may affect Mexican spotted owls through adverse effects to prey populations. As a result of these impacts, there may be decreases in nest initiation or nesting success, and decreased adult or owlet fitness.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Authorized activities under this program have the potential to increase human presence; equipment and vehicle use; vegetation disturbance; and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances or vegetation removal may adversely affect the availability and quality of prey habitat and prey abundance. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey habitat. Increased occurrence of invasive plants species may change the vegetation community and change the habitat for Mexican spotted owl prey species. As a result, there may be decreases in nest initiation or nesting success, and decreased adult and owlet fitness.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase human presence, equipment and vehicle use (including associated noise disturbances), vegetation treatment or disturbance, and surface disturbance in Mexican spotted owl habitat. Some activities, such as exclosure construction and habitat rehabilitation projects, may result in short-term disturbances but long-term benefits. Short-term adverse impacts may include, but not be limited to: disruption of normal breeding, nesting, foraging, and roosting behaviors (associated with noise and visual disturbances); decreased cover from predators and increased predation; decreased nesting habitat; and decreased prey habitat. Long-term benefits may include increased nesting success, increased prey abundance, and increased survival.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation manipulation; and surface disturbance in Mexican spotted owl habitat. Short-term adverse impacts may include, but not be limited to: disruption of normal breeding, nesting, foraging, and roosting behaviors (associated with noise and visual disturbances); decreased cover from predators and increased predation; decreased nesting habitat; and decreased prey habitat. Long-term benefits may include increased nesting success, increased prey abundance, and increased survival.

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation treatment or disturbance (mechanical, chemical, biological); and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation alteration, removal, or inadvertent chemical treatment may adversely affect availability and quality of prey habitat. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey species habitat. As a result, there may be site-specific decreases in nest initiation or nesting success, and decreased owl fitness. Long-term benefits may include increased nesting success, increased prey abundance, and increased survival.

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Because the proposed action calls for removal of horse populations, the main management activity under this program is herd gathering.

Activities occurring under this program may increase human presence; equipment, helicopter, and vehicle use; vegetation treatment or disturbance; and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances or vegetation removal may adversely affect availability of prey habitat. Soil disturbances may

increase erosion, adversely affect soil stability, increase sediment deposits, and habitat for prey species. Short-term adverse impacts may include, but not be limited to: fragmented prey habitat; decreases in nest initiation or nesting success; and decreased adult and owlet fitness.

Wildlife and Fisheries Resources

This program aims to maintain biological diversity, improve habitat for wildlife and fisheries, and provide habitats for threatened and endangered species.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation treatment or disturbance; and surface disturbance in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances or vegetation removal may adversely affect availability of prey habitat. Soil disturbances may increase erosion, adversely affect soil stability, increase sediment deposits, and habitat for prey species. Short-term adverse impacts may include, but not be limited to: fragmentation of prey habitat; decreased nest initiation or nesting success; decreased adult and owlet fitness; and alterations of water distribution within occupied habitat of the Mexican spotted owl. In general, long-term efforts to improve the health of riparian habitats may benefit Mexican spotted owls by increasing prey abundance.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Forest resources support activities such as road construction that may occur in or near existing or suitable Mexican spotted owl habitat. However, the impacts of these activities are analyzed and authorized by the lands and realty program.

Activities occurring under this program may increase human presence; equipment and vehicle use; vegetation treatment or disturbance; and surface disturbance near or in Mexican spotted owl habitat. Associated visual and noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances, vegetation removal, or chemical treatment of vegetation may adversely affect prey habitat and prey availability, and therefore, adversely affect Mexican spotted owls and their young. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey habitat and prey abundance. Increased occurrence of invasive plants species may change the vegetation community and change the habitat for Mexican spotted owl prey species. As a result, there may be decreases in nest initiation or nesting success, and decreased adult and owlet fitness.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

New water developments for wildlife would have long-term beneficial impacts to wildlife.

Activities occurring under this program will have short-term impacts, which may include an increase human presence and equipment and vehicle use (including associated noise disturbances), vegetation treatment or disturbance, and surface disturbance near or in Mexican spotted owl habitat. Associated noise disturbances may adversely affect the behavior of Mexican spotted owls during breeding, nesting, or foraging activities. Vegetation disturbances and removal may adversely affect prey habitat and prey availability, and therefore, adversely affect Mexican spotted owls and their young. Soil disturbances may increase erosion, adversely affect soil stability, and adversely affect prey habitat and prey abundance. As a result, there may be decreases in nest initiation or nesting success, and decreased adult and owlet fitness.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the Mexican spotted owl and designated critical habitat under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' critical, suitable, or potential habitat.
- Encroachment of human development into a species' critical, suitable, or potential habitat.
- Fire management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah
 - County Governments in Utah
 - Local Governments in Utah
 - Private landholders in Utah

Mexican spotted owls occur throughout the action area, generally as year-around residents (Ganey and Block 2005). In these areas, Mexican spotted owls locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. Mexican spotted owls are susceptible to activities on State and private lands. Many of these activities, such as livestock grazing, oil and gas exploration and development, human population expansion and associated infrastructure (increased trails and roads) development, research, and recreation activities (including OHV use and any activities that increase human presence), are expected to continue on State and private lands within the Mexican spotted owl's range. Contributing as cumulative effects to the proposed action, these activities will continue to affect

Mexican spotted owls' productivity with disturbances to breeding, nesting, and foraging behaviors and further fragmenting habitat of prey populations.

Conclusion

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the resource protection measures that were incorporated into the project design.

After reviewing the current status of the Mexican spotted owl and its critical habitat, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the USFWS's biological opinion that the Vernal BLM Field Office Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the Mexican spotted owl, and is not likely to destroy or adversely modify designated critical habitat. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the BLM Resource Management Plan. If project design cannot adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed BLM Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Black-footed ferret (*Mustela nigripes*)

Status of Species

Species/Critical Habitat Description

The black-footed ferret, a member of the Mustelid or weasel family, is the most endangered species in North America. The ferret has a black facemask, black legs, and a black-tipped tail. The total length is nearly 2 feet; and the ferret may weigh up to 2.5 pounds.

The black-footed ferret is a "charter member" of the Endangered Species Act (Act) and was listed as an endangered species in 1967 (32 FR 4001, March 11, 1967). Significant changes to the Endangered Species Act of 1973 (Act), as amended, were made in 1984 with the addition of subsection 10(j) to allow for the designation of specific populations of listed species as "experimental populations." Previously, we were authorized to reintroduce populations into unoccupied portions of a listed species' historical range when it would foster the conservation and recovery of the species. However, local citizens often opposed these reintroductions because they were concerned about the placement of restrictions and prohibitions on Federal and private activities. Under section 10(j), the Secretary of the Interior can designate reintroduced populations established outside the species' current range but within its historical range as "experimental and nonessential." This designation allows us considerable flexibility in managing reintroduced populations of endangered species.

Currently, the black-footed ferret is listed as endangered throughout its range except in certain areas of Wyoming, Montana, South Dakota, Arizona, Colorado, and Utah, where they are listed as nonessential experimental populations (56 FR 41473, August 21, 1994; 59 FR 42696, August 18, 1994; 59 FR 42682, August 18, 1994; 61 FR 11320, March 20, 1996; 63 FR 52823, October 1, 1998; 65 FR 60879, October 13, 2000; 68 FR 26498, May 16, 2003). The nonessential experimental population in northeastern Utah was established in 1998 and includes all of Uintah and Duchesne Counties (63 FR 52823, October 1, 1998).

Nonessential experimental populations located outside the National Wildlife Refuge System or National Park System lands are treated, for the purposes of Section 7 of the Act, as if they are proposed for listing.

Life History and Population Dynamics

Black-footed ferrets depend almost exclusively on prairie dog colonies for food, shelter, and denning (Henderson *et al.* 1969, updated 1974; Forrest *et al.* 1985; 68 FR 26498, May 16, 2003). The range of the ferret coincides with that of prairie dogs and ferrets with young have been documented only in the vicinity of active prairie dog colonies. Historically, black-footed ferrets have been reported in association with black-tailed prairie dog (*Cynomys ludovicianus*), white tailed prairie dog (*Cynomys leucurus*), and Gunnison's prairie dog (*Cynomys gunnisoni*) colonies (Anderson *et al.* 1986). Wild ferrets hunt prairie dogs at night but occasionally they are active above ground during the day. In search of prey, they move along in loping bounds from one burrow to the next. When they make a kill, ferrets may drag prairie dogs some distance to a home burrow to devour below ground or to burrows in which they have their young.

Breeding occurs between the months of February and March (UDWR 2003). Males are polygamous and do not help care for the young. Three to four young are born in the female's den after a 42-day gestation period. The young stay inside the den until they are approximately six weeks old. In mid-August, the female may separate the young into different dens. By September or October, the young are completely independent (UDWR 2003). Survivorship of young kits is low with fewer than half ever surviving to adulthood (UDWR 2003). While ferrets have been recorded to live up to nine years, they typically live for only three to four years in the wild (UDWR 2003).

Status and Distribution

The black-footed ferret is the only ferret species native to North America. The historic range of the species, based on specimen collections, extends over 12 western states (Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming) and the Canadian Provinces of Alberta and Saskatchewan. Prehistoric evidence indicates that ferrets once occurred from the Yukon Territory in Canada to Mexico and Texas (Anderson *et al.* 1986; 68 FR 26498, May 16, 2003).

Significant reductions in both prairie dog numbers and distribution occurred during the last century due to widespread poisoning of prairie dogs, the conversion of native prairie to farmland, and outbreaks of sylvatic plague, particularly in the southern portions of the ranges of several species of prairie dog in North America. Sylvatic plague arrived from Asia in approximately 1900 (Eskey and Haas 1940; 68 FR 26498, May 16, 2003). Epidemic diseases like plague may

kill an entire prairie dog population, completely eliminating the ferrets' primary food source, or ferrets may directly contract diseases like canine distemper, pneumonia or tularemia (a disease of the liver) (Williams *et al.* 1991; Williams *et al.* 1994; 68 FR 26498, May 16, 2003; UDWR 2003). Black-footed ferrets are also susceptible to a variety of internal nematodes, external ticks and mites (UDWR 2003). This severe reduction in the availability of their principal prey species, in combination with other factors such as secondary poisoning from toxicants ingested by prairie dogs, resulted in the near extinction of the black-footed ferret in the wild by the early 1970s (USFWS 1988). Canine distemper, in conjunction with captures for captive breeding, resulted in extirpation of the last known wild population by early 1987 (NatureServe 2005; Forrest *et al.* 1988; Thorne and Williams 1988).

In 1974, a remnant wild population of ferrets in South Dakota, originally discovered in 1964, abruptly disappeared (Henderson *et al.* 1969, updated 1974). As a result, the species was believed to be extinct. However, in 1981, a small population was discovered near Meeteetse, Wyoming (Schroeder and Martin 1982). In 1985–86, the Meeteetse population declined to only 18 animals due to outbreaks of sylvatic plague and canine distemper (USFWS 1988). Following this critical decline, the remaining individuals were taken into captivity in 1986–1987 to serve as founders for a captive propagation program. Since that time, captive breeding efforts have been highly successful and have facilitated ferret reintroductions throughout the formerly occupied range. Today, the captive population of juveniles and adults annually fluctuates between 300 and 600 animals depending on time of year, yearly reproductive success, and annual mortalities (68 FR 26498, May 16, 2003). The captive ferret population is currently divided among six captive-breeding facilities throughout the United States and Canada, with a small number on display for educational purposes at several facilities. Also, 65 to 90 ferrets are located at several field-based captive breeding sites in Arizona, Colorado, Montana, and New Mexico (68 FR 26498, May 16, 2003).

Environmental Baseline

Status of the Species within the Action Area

This species' historical distribution in Utah matches that of white-tailed and Gunnison prairie dogs and is considered to be within Carbon, Daggett, Duchesne, Emery, Grand, Rich, San Juan, Summit, and Uintah Counties. No wild populations of this species are known to still exist in Utah, and it is believed that the species is extirpated from the state.

The current known range of black-footed ferret in Utah is limited to Coyote Basin and Snake John in the far eastern portions of Uintah County. There is potential for wild-born animals to move into the Kennedy Wash area due to the close proximity to occupied habitat. The Coyote Basin Primary Management Zone (PMZ) consists of 51,563 acres straddling the Utah-Colorado border approximately 32 miles southeast of Vernal, Utah. The PMZ includes most of Coyote Basin and parts of Kennedy Wash and is part of the larger Northeastern Utah Experimental Population Sub-Area. The joint rule issued by the USFWS under 10j of the Act (63 FR 52824, October 1, 1998) affords nonessential-experimental protection to the black-footed ferret over 4,942,720 acres of habitat and includes all of Uintah and Duchesne Counties in Utah.

Land ownership in the nonessential, experimental population area is 54 percent Federal public lands (i.e., BLM, Forest Service, USFWS, Bureau of Reclamation, National Park Service), 24

percent private lands, 16 percent Ute Indian Tribe trust reservation lands, and 6 percent state lands (63 FR 52824, October 1, 1998). The Coyote Basin PMZ is comprised of predominantly federal land (87.7%) administered by the BLM. State trust lands (11.8%) and private land (0.5%) make up the remainder of the land ownership within the PMZ.

In October and November of 1999, 72 black-footed ferrets were released in Coyote Basin and the first wild born kits were seen the following summer (UDWR 2003). From October 1999 through November 2002, 215 black-footed ferrets were released into Coyote Basin (Bibles 2002). Intensive 10-day spotlighting efforts were conducted from August 20th through the 29th in Coyote Basin in 2002 (Bibles 2002). Twenty-nine individual ferrets were sighted, including 21 adults and 8 kits (Bibles 2002). Annual spotlight surveys through 2008 continue to document kit production as well as adult survival. Actual population numbers are unknown.

Factors Affecting Species Environment within the Action Area

The main causes of decline in the ferret population throughout its range include the destruction or conversion of native grassland habitat to agriculture or urbanization; elimination of natural prey and den holes (due to pest control of prairie dogs); and diseases such as sylvatic plague and canine distemper, which has directly affected black-footed ferret, and resulted in substantial declines in its prey species of prairie dogs.

Plague and resultant fluctuations in prairie dog population numbers continue to affect ferrets in northeastern Utah. Land use practices within the Coyote Basin Primary Management Zone (PMZ) and surrounding areas include oil and gas development, Gilsonite mining, livestock grazing, power production and recreation (BLM 1999). Several jeep trails and two tracks cut through the PMZ from various directions. Three power and transmission lines cross the PMZ from Deseret Generation and Transmission Co-operative's Bonanza Power Plant to Colorado. In addition, many small power lines associated with Gilsonite mining and oil/gas extraction cross the PMZ (BLM 1999).

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program including resource surveys and excavations could increase human presence and require vehicles and heavy machinery. Associated noise and visual stimulation may lead to disturbance and displacement of individuals from occupied habitats. Individuals may be killed by machinery or vehicles. Excavation-related surface disturbance activities may lead to erosion or degradation of habitat due to vegetation removal, with resultant reductions in prey populations for the black-footed ferret. As a result, black-footed ferret adults and offspring may experience reduced fitness or mortality.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program including resource surveys and excavations could increase human presence and require vehicles and heavy machinery. Associated noise and visual stimulation may lead to disturbance and displacement of individuals from occupied habitats. Individuals may be killed by machinery or vehicles. Excavation-related surface disturbance activities may lead to erosion or degradation of habitat due to vegetation removal, with resultant reductions in prey populations for the black-footed ferret. As a result, black-footed ferret adults and offspring may experience reduced fitness or mortality.

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resource values from wildfire and restore the natural role of fire in the ecosystem. Major activities associated with the fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Black-footed ferrets and suitable habitat occur in grassland and sagebrush habitats. All components of fire management could be utilized within potentially suitable or occupied habitat for the black-footed ferret. Wildland fire suppression may have direct, negative effects on black-footed ferrets and damage or destroy occupied or suitable habitat. Suppression operations may harass, displace, injure, or kill black-footed ferrets or their prairie dog prey from smoke or fire during backfires, surface disturbance, or human-caused disturbance. Wildland fire suppression operations may adversely affect black-footed ferrets or prey if they are unintentionally sprayed with fire retardant. Following a fire, short-term adverse impacts may occur from reduced food supplies, loss of surface cover, and increased predation.

Wildland fire use and prescribed fire would only be authorized in suitable or occupied black-footed ferret habitat if potential negative effects to the species have been considered and minimized or avoided. Potential impacts from wildland fire use and prescribed fire would be similar to those from wildfire suppression. Non-fire fuels treatments and emergency stabilization and rehabilitation following wildfires may be used to retain or improve range conditions and maintain lower fuel loads in grassland and sagebrush habitats suitable for black-footed ferrets. Negative impacts include harassment, displacement, injury, or mortality; or a reduction in prey from surface disturbance. Most of these effects would be short-term and of low intensity due to the conservation measures. Additionally, these fire management activities could benefit black-footed ferrets due to improved habitat quality, resulting in a larger prey base.

Lands and Realty Management

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Increased vehicular traffic and human presence and construction activities associated with the lands and realty program could directly and indirectly impact black-footed ferrets. Increased vehicular traffic could lead to mortality from vehicle collisions or potential poaching. Increased human presence (and associated noise and visual stimulation) may result in disturbance and displacement of individuals from occupied habitats, and lead to physical distress, decreased health, and/or mortality.

Surface disturbance resulting from construction activities may result in erosion or degradation of habitat due to vegetation removal and increased potential for invasive species, leading to reduced prairie dog prey populations. Additional negative impacts include direct loss of habitat and direct mortality due to: displacement and habitat fragmentation and modification.

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder some wildlife species: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Grazing by livestock and surface disturbing construction may result in a vegetation shift from grass to shrub forage, weed infestations, and erosion, leading to lower quality habitat and potential loss or reduction of prairie dog colonies; reducing the prey base for black-footed ferrets; and possibly displacing individuals. As a result, black-footed ferret adults and offspring may experience a reduction in fitness.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium), and salable (sand, gravel, building stone) minerals. Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Geological and mining activities have the potential to affect black-footed ferrets. General direct and indirect effects resulting from this program would include increased human presence and vehicle traffic in ferret habitat and surface disturbance. Specific negative impacts include decreased availability and use of suitable habitat; direct loss of habitat; and a decrease in prairie dog prey. As a result, black-footed ferret adults and offspring may experience a reduction in fitness. There is some potential for mortality if energy exploration or development activities result in the crushing of burrows. Increased vehicle traffic could also result in mortality from vehicle collisions.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Increased human presence (and associated noise and visual stimulation) due to recreation activities may result in disturbance and displacement of individuals from occupied habitats, and leading to physical distress, decreased health, and mortality. Increased vehicular traffic could lead to mortality from vehicle collisions or the collapse of burrows. Surface disturbance activities may result in erosion or degradation of habitat due to vegetation removal, leading to reduced prairie dog prey population levels. As a result, black-footed ferret adults and offspring may experience a reduction in fitness or mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Although the riparian area management program is not expected to directly impact the ferret, indirect impacts may occur from displacing recreation use, OHV use, and livestock from riparian areas to upland areas suitable for black-footed ferrets. In addition, the implementation of riparian improvement projects may increase human and equipment disturbance near and within ferret habitat. Human disturbances (including associated noise and visual stimulation) may

displace individuals from occupied habitats, resulting in physical distress, decreased health, and/or mortality. Surface disturbance activities may result in erosion or degradation of habitat and lead to reduced prairie dog prey populations. As a result, black-footed ferret adults and offspring may experience reduced fitness.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Although the soil and water program is not expected to directly impact the ferret, indirect impacts may occur from displacing recreation use, OHV use, and livestock from riparian areas to upland areas suitable for black-footed ferrets. In addition, the implementation of soil and water resource projects may increase human and equipment disturbance within or near ferret habitat. Human disturbances (including associated noise and visual stimulation) may displace individuals from occupied habitats and may lead to physical distress, decreased health, and/or mortality. Surface disturbance activities may result in erosion or degradation of habitat and lead to reduced prairie dog prey populations. As a result, black-footed ferret adults and offspring may experience reduced fitness.

Vegetation Resources

Program objectives are to maintain or improve the diversity of plant communities to support livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Potential adverse impacts may include direct mortality of individuals from chemical treatments, increased human presence, and damage to burrows. Increased human presence (and associated noise and visual stimulation) due to vegetation management activities may result in disturbance and displacement of individuals from occupied habitats, leading to physical distress, decreased health, and mortality. Damage to burrows may occur as a result of using heavy equipment for reseeding or mechanical removal of undesirable vegetation. Additionally, surface disturbance activities may result in erosion or degradation of habitat and lead to reduced prey populations. As a result, black-footed ferret adults and offspring may experience loss of fitness or mortality.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, improve habitat on for wildlife and fisheries, and provide habitats for threatened and endangered species.

Surface disturbing activities could destroy existing colony structure and cause direct mortality of the species. Additionally, surface disturbance may result in erosion or degradation of habitat and lead to reduced prey populations. As a result, black-footed ferret adults and offspring may experience loss of fitness or mortality. However, if activities were established to promote new-growth vegetation including native grasses and forbs (i.e., prescribed burns), these activities would likely increase prey populations over time.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Increased human presence (and associated noise and visual stimulation) due to recreation activities may result in disturbance and displacement of individuals from occupied habitats, and leading to physical distress, decreased health, and mortality. Increased vehicular traffic could lead to mortality from vehicle collisions and collapse of burrows. Surface disturbance activities may result in erosion or degradation of habitat due to vegetation removal, leading to reduced prairie dog prey population levels. As a result, black-footed ferret adults and offspring may experience a reduction in fitness or mortality.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to federally protected black-footed ferrets under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' suitable or potential habitat.
- Encroachment of human development into a species' suitable, or potential habitat.
- Fire management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah
 - County Governments in Utah
 - Local Governments in Utah
 - Private landholders in Utah

As public lands within the VPA are interspersed and bordered by Tribal, State, and private lands, activities within these non-federally managed lands are likely to affect natural resources within BLM managed areas. Black-footed ferrets are susceptible to activities on State and private lands. Future non-federal threats to the species include intentional poisoning, shooting, diseases such as plague, habitat loss and degraded habitat quality, and environmental conditions such as vegetation changes and drought (Crocker-Bedford 1975; Collier 1975; USFWS 1991). Factors leading to degraded habitat quality arise from land ownership and management practices,

including mineral development, OHV use, overgrazing and fire suppression. Mineral development and OHV use has led to direct habitat loss, introduction of invasive weed species, and the increased potential for poaching of both ferrets and their prey base. Overgrazing could lead to vegetation changes from grass to shrub; erosion of the swales that were historically occupied by prairie dogs; and lowered water tables which in turn reduces the amount of moisture available for palatable grasses and forbs that supply summer food for prairie dogs.

Conclusion

The conclusions of this biological opinion are based on full implementation of the programs as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the status of the black-footed ferret, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the USFWS's biological opinion that the Vernal BLM Field Office Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the black-footed ferret. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the BLM Resource Management Plan. If project design can not adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed BLM Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Canada lynx (*Lynx canadensis*)

Status of Species

Species/Critical Habitat Description

The Canada lynx (*Lynx canadensis*) occurs across the boreal forests of Canada and Alaska into isolated spruce, fir and lodgepole pine forests of the northern United States including Washington, Montana, Wisconsin, Michigan, New England and Maine. Isolated and/or dispersing populations are thought to occur in northeastern Oregon, Wyoming, Utah and Colorado (USFWS 2003). Lynx are generally found in the northern boreal forest in association with snowshoe hare habitat or habitat of other suitable prey species. Early successional stands with high densities of shrubs and seedlings are optimal for hares, and subsequently provide important habitats for lynx foraging activities. Mature forest stands are used for denning, cover, and travel corridors (Ruggiero et al. 1999).

Life History and Population Dynamics

The lynx is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short, black-tipped tail (McCord and Cardoza 1982). Adult males average 10 kg in weight and 85 cm in length from head to tail, and females average 9 kg and 81 cm in length from head

to tail (Quinn and Parker 1987). The lynx's long legs and large feet make it highly adapted for hunting in deep snow. Lynx use large woody debris, such as downed logs and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982; Koehler 1990; Koehler and Brittell 1990; J. Organ, USFWS, *in litt.* 1999). For lynx den sites, the age of the forest stand does not seem as important as the amount of downed, woody debris available.

The size of lynx home ranges varies by the animal's gender, abundance of prey, season, and the density of lynx populations (Hatler 1988; Koehler 1990; Poole 1995). Documented home ranges vary from 8 to 800 km² (Saunders 1963; Brand *et al.* 1976; Mech 1980; Koehler and Aubry 1994). Preliminary research supports the hypothesis that lynx home ranges at the southern extent of the species' range are generally large compared to those in the northern portion of the range in Canada (Koehler and Aubry 1994).

Lynx are highly specialized predators whose primary prey is the snowshoe hare (*Lepus americanus*); both species have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982). Snowshoe hares use forests with dense understories that provide forage, cover to escape from predators, and protection during extreme weather (Wolfe *et al.* 1982; Monthey 1986; Hodges 1998, 1999). Generally, earlier successional forest stages have greater understory structure than do mature forests and therefore support higher hare densities (Hodges 1998, 1999). However, mature forests can also provide snowshoe hare habitat as openings develop in the canopy of mature forests when trees succumb to disease, fire, wind, ice, or insects, and the understory grows. Lynx concentrate their hunting activities in areas where hare activity is relatively high (Koehler and Aubry 1994; Ward and Krebs 1985). Lynx also prey opportunistically on other small mammals and birds, particularly when hare populations decline (Nellis *et al.* 1972; Brand *et al.* 1976; McCord and Cardoza 1982).

Status and Distribution

The Canada lynx is Federally listed as Threatened by the USFWS. In 1994, the USFWS (FR, 26 August 1994) found that federal listing of the North American population of Canada Lynx may be warranted and initiated a formal status review. In 1997, the USFWS (FR, 27 May 1997) determined that listing of the contiguous U.S. population is warranted but precluded by other higher priority actions. In 1998, the USFWS (FR, 8 July 1998) proposed listing the U.S. lower 48 population segment as threatened. In 1999, the USFWS (FR, 8 July 1999) extended for not more than six months a decision to list the contiguous United State population segment as a threatened species; this extension was made to allow time to resolve a dispute over the status of the U.S. lower 48 lynx population. In 2000, the USFWS determined threatened status for the contiguous U.S. distinct population segment of *L. canadensis*. In 2006, the USFWS designated critical habitat for the contiguous U.S. distinct population segment. In total, approximately 4,768 km² fall within the boundaries of the critical habitat designation, in three units in the States of Minnesota, Montana and Washington (Federal Register, 9 November 2006). No designated critical habitat exists within the state of Utah.

The historical and present range of the lynx north of the contiguous United States includes Alaska and that part of Canada that extends from the Yukon and Northwest Territories south

across the United States border and east to New Brunswick and Nova Scotia. In the contiguous United States, lynx historically occurred in the Cascades Range of Washington and Oregon; the

Rocky Mountain Range in Montana, Wyoming, Idaho, eastern Washington, eastern Oregon, northern Utah, and Colorado; the western Great Lakes Region; and the northeastern United States region from Maine southwest to New York. In the contiguous United States, the distribution of the lynx is associated with the southern boreal forest, comprising of subalpine coniferous forest in the West and primarily mixed coniferous/deciduous forest in the East; whereas in Canada and Alaska, lynx inhabit the classic boreal forest ecosystem known as the taiga (65 FR 16052, March 24, 2000).

Forest management practices that result in the loss of diverse age structure, fragmentation, road construction, urbanization, agriculture, recreational developments, and unnatural fire frequencies have altered suitable habitat in many areas. As a result, many states may have insufficient habitat quality and/or quantity to sustain lynx or their prey. Human access into habitat has increased dramatically over the last few decades contributing to direct and indirect mortality and displacement from suitable habitat.

Environmental Baseline

Status of the Species within the Action Area

In the summer of 2004, two radio-collared male lynx from the experimental nonessential Colorado transplant population were detected in Utah. One lynx crossed through the Wasatch-Cache National Forest while traveling northward along the Wasatch Front. It continued to head north out of the Forest into Idaho or Wyoming. The other lynx, after crossing the Uinta Mountains, headed southward towards Panguitch (Email from Richard Williams, Wasatch-Cache National Forest Biologist, September 28, 2004). In addition, there is one report of a lynx trapped in Cache County in 1991 (Ruggiero et al. 1999). The Utah population is isolated and considered to be comprised primarily of dispersing rather than breeding individuals.

Although there may be some individual lynx moving through the VFO area, no known resident populations of lynx have been documented within the VPA in recent years. In December 2006 two lynx were trapped after being treed by dogs and tranquilized (as per conversation with Brian Maxfield of UDWR, 2007). A female was caught on the north end of the Book Cliffs near Argyle Canyon. The other, a male, was caught in the Mineral Mountains between Beaver and Milford, Utah. It is believed that both lynx migrated from the San Juan Mountains in Colorado where Colorado state wildlife officials started an experimental population in 1999, and both lynx were relocated back into the release area in Colorado in December of 2006.

These examples demonstrate at least occasional use of habitat, and the action area likely functions as a linkage zone. Therefore, the following effects determination is written to assess impacts should lynx use the planning area. The RMP planning process is a long-term planning effort, and thus we are analyzing activities for this potential.

Factors Affecting Species Environment within the Action Area

Past extensive logging that eliminated habitat for lynx and snowshoe hare was detrimental to the species rangewide. Habitat has been lost due to suppression of forest fires and ecological succession to habitats that no longer support snowshoe hare and lynx. Fragmentation, due to forestry, agriculture, and roads, and the subsequent isolation of suitable habitat is a concern. Road construction causes habitat fragmentation, incidental harvest of lynx in the course of legal trapping/hunting for other species may be a problem in some areas. Increased winter recreation (snowmobiles, ski area development) may be causing displacement and/or incidental mortality of lynx. Habitat changes and increased access into lynx habitats has resulted in increased competition and displacement of lynx by bobcat and coyote in some areas.

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program including resource surveys and excavations could increase human presence and require vehicles and heavy machinery. Associated noise and visual stimulation may lead to disturbance and displacement of individuals from occupied habitats. As a result, lynx may be displaced or experience reduced fitness.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program including resource surveys and excavations could increase human presence and require vehicles and heavy machinery. Associated noise and visual stimulation may lead to disturbance and displacement of individuals from occupied habitats. As a result, lynx may be displaced or experience reduced fitness. In addition, increased vehicle use may result in roadway mortality of lynx.

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resources values from wildfire and restore the natural role of fire in the ecosystem. Major activities associated with the fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Wildland fire suppression may have negative effects on Canada lynx by reducing downed woody material in occupied or suitable habitat. Suppression operations may harass, displace, injure, or kill Canada lynx or prey from smoke or fire during backfires, surface disturbance, or human-caused disturbance. Following a fire, short-term adverse impacts may occur from reduced in food supplies, loss of surface cover, and increased predation. Fire suppression may also lead to habitat fragmentation from operations including fire line construction and road development.

Potential impacts from wildland fire use and prescribed fire would be similar to those from wildfire suppression. Non-fire fuels treatments and emergency stabilization and rehabilitation following wildfires may be used to retain or improve range conditions and maintain lower fuel loads, benefiting the prey base of the Canada lynx. Short-term negative impacts include harassment, displacement, injury, or mortality; or a reduction in prey from surface disturbance. As a result from these activities, Canada lynx could be displaced from suitable habitat, experience a loss of fitness and rarely, mortality.

Lands and Realty Management

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Increased vehicular traffic and human presence and construction activities associated with the lands and realty program could directly and indirectly impact Canada lynx. Increased vehicular traffic could lead to mortality from vehicle collisions. Increased human presence (and associated noise and visual stimulation) may result in disturbance and displacement of individuals from occupied habitats, and leading to physical distress, decreased health, and/or mortality.

Surface disturbance resulting from construction activities may result in erosion or degradation of habitat due to vegetation removal and increased potential for invasive species, leading to reduced prey populations. In addition, land sales, exchanges and ROWs could contribute to habitat fragmentation, disrupting travel corridors for the lynx. As a result, Canada lynx could experience a loss of fitness or displacement from suitable habitat.

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can

be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder some wildlife species: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Livestock grazing could have direct and indirect effects on lynx habitat, including a reduction in available forage for lynx prey (primarily snowshoe hare) and disturbance in prey habitat. As a result, lynx could experience reduced fitness.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program could lead to an increase in road density and the loss, modification or fragmentation of habitat suitable for Canada lynx and their prey. In addition, light, noise and visual stimulation from energy and mineral projects could lead to disturbance and displacement of individuals from occupied habitats. Increased human presence may result in disturbance of lynx. As a result from these activities, Canada lynx could be displaced from suitable habitat, experience a loss of fitness and rarely, mortality.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Increased human presence, including associated noise and visual stimulation, may result in disturbance and displacement of individuals from occupied habitats. Increased access to areas where trapping is allowed could result in the accidental trapping and injury or mortality of lynx. Increased vehicular traffic could lead to mortality from vehicle collisions. Surface disturbance activities may result in erosion or degradation of habitat due to vegetation removal, with resultant reductions in prey population levels. As a result from these activities, Canada lynx could be displaced from suitable habitat, experience a loss of fitness or mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Canada lynx can use riparian areas for hunting and as travel corridors. Fencing of riparian areas could lead to increased habitat fragmentation and disrupt linkage zones between areas. Increased human presence, including associated noise and visual stimulation, may result in disturbance and displacement of individuals from occupied habitats. Canada lynx could be displaced from suitable habitat, and/or experience a loss of fitness.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Although the soil and water management program is not expected to directly impact the lynx, indirect impacts may occur from increased human presence and equipment disturbance. Human disturbances (including associated noise and visual stimulation) may displace lynx and their prey from occupied habitats. Surface disturbance activities may result in erosion or degradation of habitat and lead to reduced prey populations. As a result, Canada lynx could experience a loss of fitness.

Vegetation Resources

Program objectives are to maintain or improve the diversity of plant communities to support livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Potential adverse impacts may include increased human presence (and associated noise and visual stimulation) due to vegetation management activities. Additionally, surface disturbance activities may result in erosion or degradation of habitat. These impacts may lead to reduced prey populations. As a result, Canada lynx could be displaced from suitable habitat, and/or experience a loss of fitness.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, improve habitat on for wildlife and fisheries, and provide habitats for threatened and endangered species.

The majority of the activities under this program are surface disturbing projects intended to improve wildlife habitat. Short term effects could include a temporary decrease in prey base, however, in the long term prey species would likely increase. In addition, herd management of ungulate species could have a negative effect by increasing competition with smaller prey species. In the short-term, Canada lynx could be displaced from suitable habitat from lack of prey or experience a loss of fitness.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

The majority of the activities under this program are surface disturbing projects intended to improve wildlife habitat. Short term effects could include a temporary decrease in prey base, however, in the long term prey species would likely increase. In addition, new water sources could impact ungulate herd movement, concentrating these species and increasing competition with smaller prey species. As a result, Canada lynx could be displaced from suitable habitat or experience a loss of fitness.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the Canada lynx and its habitat under the Proposed Actions would include, but not be limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' suitable or potential habitat.
- Encroachment of human development into suitable habitat.
- Fire management actions by some, or all, of the following groups, on lands adjoining BLM-administered lands:
 - State of Utah
 - County Governments in Utah
 - Local Governments in Utah
 - Private landholders in Utah

Canada lynx locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. Canada lynx are susceptible to activities on State and private lands. Many of these activities, such as human population expansion and associated

infrastructure (increased roads); oil and gas exploration and development; research; and unregulated recreation activities (e.g. off-highway vehicles) may contribute to negative cumulative effects to the Canada lynx through human-caused injury or mortality, elimination of or disturbance to colonies, tunnels, and den sites, destruction or degradation of native grassland or sagebrush habitats, and spreading disease, such as distemper. Contributing as cumulative effects to the proposed action, these activities will continue to affect Canada lynx population persistence by contributing to loss and fragmentation of small, isolated colonies.

Conclusion

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the current status of the Canada lynx, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the Vernal BLM Field Office Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the Canada lynx. Critical habitat has not been designated for this species. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the BLM Resource Management Plan. If project design cannot adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed BLM Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Ute ladies'-tresses (*Spiranthes diluvialis*)

Status of the Species

Species Description

The Ute ladies'-tresses (*Spiranthes diluvialis*) was first described as a species in 1984 by Dr. Charles J. Sheviak from a population discovered near Golden, Colorado (Sheviak 1984). The Ute ladies'-tresses are perennial orchids from the family Orchidaceae. The orchid first appears above ground as a rosette of thickened grass-like leaves that is very difficult to distinguish from other vegetation. Its leaves are up to 1.5 cm wide and 28 cm long; the longest leaves are near the base. The usually solitary flowering stem is 20 to 50 cm tall, terminating in a spike of 3 to 15 white or ivory flowers. The range in elevation of known orchid populations in Utah is from 1,300 to 2,100 meters (USFWS 2003). In Utah, Ute ladies'-tresses are known to occur predominantly in the northern and northeastern portions of the state. The orchid also occurs in three scattered locations in the western and southern portions of the state (USFWS 2003).

Orchid habitats must consist of sufficient hydrology to keep soils moist at the surface throughout the growing season. Soils are generally silty-loam often underlain with cobble and gravel. The

habitat settings are early to mid-successional riparian habitats (i.e. well established soils and vegetation) along perennial streams and rivers such as moist stream edges, high flow channels, old oxbows, vegetated point bars, and other fluvial features (USFWS 1992a, Fertig et. al. 1994; USFWS 1995; Fertig 2000). The orchid may also occur in settings that mimic one of the above habitats, such as moist borrow pits, roadside ditches, reservoir edges, and berms (Ward and Naumann 1998).

Perennial graminoids and forbs and low vegetative cover dominate habitats occupied by Ute ladies'-tresses. A few populations in eastern Utah and Colorado are found in riparian woodlands, but generally the species seems intolerant of shade, preferring open, grass, sedge, and forb-dominated sites. Where colonies occur in more wooded areas, plants are usually found on the edges of small openings and along trails (Ward and Naumann 1998). The orchid is intolerant of crowding and competition. The orchid may persist for some time in the grassy understory of woody riparian shrublands, but does not appear to thrive under these conditions (Ward and Naumann 1998).

Ute ladies'-tresses in Utah seem to have persisted regardless of the activities and influences of humans (USFWS 2003). In some cases, the orchid's habitat has apparently shifted to new locations and the species has thrived as a result of modified hydrologic regimes. Irrigation and grazing have also created and maintained suitable habitat conditions where they did not previously exist.

Life History and Population Dynamics

Flowering of Ute ladies'-tresses generally occurs from mid-July through August, at which point location, identification, and population size estimates are typically determined. However, in some locations the plant may bloom in early July or may still be in flower as late as early October. Some individuals remain underground or do not flower each year (Arft 1995; Riedel 1992).

Because of the unique anatomy of orchid flowers, only certain insects can accomplish pollination. Reproduction of the orchid is strictly sexual, with bumblebees (*Bombus* spp.) and anthophorans (*Anthophora* spp.) (Sipes and Tepedino 1995; Sipes et. al. 1995) as the primary pollinators. These insects visit the orchids for the nectar and pollination is accomplished incidentally. The number of seeds of the orchid varies greatly between plants. Each orchid fruit can have several hundred or up to 10,000 seeds but generally average around 2,000 (Sipes and Tepedino 1995). These seeds may be dispersed by water or wind (Wells 1981).

Status and Distribution

Ute ladies'-tresses were federally listed as threatened on January 17, 1992 (57 FR 2048) throughout its entire range. No critical habitat has been designated for the species. To date, no recovery plan has been approved for this species. However, a draft recovery plan has been written (USFWS 1995).

Populations of orchids are known from three broad general areas of the interior western United States: near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north-central and central Colorado; in the Upper Colorado River Basin,

particularly in the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, in north-central and western Utah, extreme eastern Nevada, and southeastern Idaho, and central Washington.

At the time of its listing, the total known population size of Ute ladies'-tresses was fewer than 6,000 individuals from 11 populations occurring in Colorado, Utah, and Nevada (57 FR 2048). Several populations on the Wasatch Front, Utah; Great Basin, Utah and Nevada; and the Front Range of Colorado were believed to be extirpated due to activities associated with frontier settlement (urbanization, clearing land for agriculture, water diversion, etc.). Most known populations contained fewer than 1,000 plants when counted in 1990 and 1991. Eastern Utah populations were typically small in size. Since 1993, *S. diluvialis* has been discovered in southeastern Wyoming, southwestern Montana, western Nebraska, southern Idaho, and central Washington (Fertig et al. 2005). Populations are now known to occur in 38 watersheds at elevations ranging from 220 to 558 m (720 to 1,830 ft) in Washington to 2,134 m (7,000 ft) in northern Utah (Fertig et al. 2005). Recovery driven inventory efforts indicate that the number of existing and historical populations is 61, of which 53 are considered extant. Of all extant populations, 60 percent contain over 100 plants and 21 percent have greater than 1,000 individuals.

Population numbers, based on counts of flowering individuals, fluctuate greatly ranging from 23% to 79% (Ward and Naumann 1998). This is because a varying proportion of the population may either be dormant underground or in a vegetative (non-flowering) state thus, not easily discerned during population monitoring. Therefore, the number of flowering adults does not give an accurate population size or structure. Monitoring of both flowering and vegetative plants by Arft (1995) indicated that population size may be fairly stable even though the number of flowering individuals demonstrates high variability. The life span of individuals is unknown, but plants studied over a nine year period were used to estimate a life expectancy of more than 50 years (USFWS 1995).

Environmental Baseline

Status of the Species within the Action Area

At the time of listing, populations of *Spiranthes diluvialis* were known from Daggett, Duchesne, Garfield, Uintah, Utah, and Wayne Counties and historical occurrences were known from Salt Lake, Tooele, and Weber Counties in the Duchesne, Escalante, Fremont, Jordan, Lower Green, Lower Weber, Southern Great Salt Lake Desert, Spanish Fork, Upper Green-Flaming Gorge Reservoir, and Utah Lake watersheds. Since 1992, new sites have been documented along the Wasatch Front and the Uinta Basin, extending the species' known distribution into Wasatch County and the Ashley-Brush, Provo, and Strawberry watersheds. Four historical occurrences are considered extirpated. Currently, there are 28 populations in Utah. The maximum annual population count of the orchid in the state of Utah is estimated to be 47,859 (Fertig et. al. 2005), distributed across Daggett, Duchesne, Garfield, Salt Lake, Tooele, Uintah, Utah, Wayne, Wasatch, and Weber counties. Four populations of Ute ladies'-tresses are presently found in the VPA: (1) Along the Green River in Browns Park (Daggett County); (2) in the Cub Creek drainage in Dinosaur National Monument (Uintah County); (3) along the along the Uinta and Whiterocks Rivers near Whiterocks (Duchesne and Uintah Counties); and, (4) along the

Duchesne River near Duchesne (Duchesne County). Most populations are small, consisting of between 20 and 500 individual plants (UDWR 1998, USFWS 1992).

Factors Affecting Species Environment within the Action Area

Factors that could affect the orchid include natural or human-directed disturbances, such as the modification of hydrology, increased recreation use, introduction or proliferation of invasive species, improper herbicide use, reduction or loss of pollinators, and improper season and stocking rate of livestock grazing (USFWS 1995a).

Channelization of waterways and construction of levees that isolate a stream from its floodplain prevent formation and maintenance of suitable habitat (USFWS 2003). These activities also eliminate periodic disturbances that remove competitive shrub stands, and re-saturates and rejuvenates old and new habitats (Moseley 1998b; Fertig 2000; USFWS 2003).

Hay mowing, or fire, may reduce suitable habitat conditions for the orchid by reducing cover, litter, and weeds. Population reductions may also result, especially when these activities occur during the flowering period (Arft 1995; Moseley 1998a).

Many occupied habitats are in more mountainous or rural locations and are not as susceptible to the direct effects of urban development. However, some scattered locations are subject to rural development such as gravel pit excavations, irrigation diversions, and construction of irrigation canals, roads, and bridges.

Recreational development may cause direct (placing trails or campgrounds in occupied or suitable habitat) or indirect (changes in hydrology, spread of invasive species) impacts to the orchid (USFWS 2003). Campground facilities, road and parking lot construction and improvements, trails, and fisheries improvements result in increased access to and use of riparian and wetland areas that support Ute ladies'-tresses.

A newly emerging and potentially serious threat to the orchid range-wide is the proliferation of invasive native and non-native plant species. The orchid is susceptible to below-ground competition, such as from strongly rhizomatous species, or aboveground competition that reduces light such as taller trees and shrubs. Tamarisk is of particular concern as it readily invades newly formed habitat before the orchid can become established, is extremely competitive, and may change soil surface chemistry through deposition of salty leaf litter.

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program may increase minor surface disturbance for cultural resource excavations. Activities occurring under this program may increase localized foot traffic,

motorized traffic, and use of tools in suitable Ute ladies'-tresses habitat. These activities may result in: alteration of soil hydrology; trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, and increased plant damage or individual mortality.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program may increase minor surface disturbance for fossil resource excavations. Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools in suitable Ute ladies'-tresses habitat. These activities may result in: alteration of soil hydrology; trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, and increased plant damage or individual mortality.

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resources values from wildfire and restore the natural role of fire in the ecosystem. Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Management activities occurring under this program may increase foot traffic, motorized presence, and vegetation treatments in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance; soil erosion and compaction; impacts from herbicides; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. Direct impacts include damage from fire or fire retardants. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Lands and Realty Management

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way.

Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities authorized under this program may adversely impact Ute ladies'-tresses with human- and equipment-related soil disturbances. Soil disturbance, erosion, and compaction may impact individual plants, modify or degrade suitable habitat, reduce pollinator populations, and reduce the seed bank. Land exchanges may result in loss, fragmentation, or degradation of Ute ladies'-tresses habitat. As a result, there may be loss or degradation of plant populations; decreased recruitment; and increased occurrence of plant damage and individual mortality.

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder some wildlife species: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Activities occurring under this program may increase and concentrate domestic ungulate presence, increase motorized traffic, and cause surface disturbance from fence and livestock pond construction in Ute ladies'-tresses suitable habitat. These activities may increase the occurrence of trampling or crushing of individuals; increase erosion and compaction; increase occurrence of exotic plant species; reduce pollinator populations; and modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage, individual mortality, and loss or degradation of habitat.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program may increase foot traffic, motorized traffic, and significant soil disturbance. These activities may cause trampling or crushing of individuals; soil erosion and compaction; loss, modification, or degradation of suitable habitat; reduced seed banks; loss of pollinator populations; increased occurrences of invasive plant species; and increased occurrence of illegal collection due to increased human access. As a result, there may be loss or degradation of plant populations; decreased Ute ladies'-tresses seed production; decreased recruitment; and increased occurrence of plant damage or individual mortality.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Activities occurring under this program may increase human, horse, and motorized traffic in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals; collection of individuals due to increased human access; increased soil disturbance, erosion, and compaction; loss, modification or degradation of suitable habitat; reduced seed banks; and increased occurrences of invasive plant species. As a result, there may be decreased recruitment, and increased occurrence of plant damage or individual mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable Ute ladies'-tresses habitats. Land treatments may lead to short-term increased soil erosion, and storm water runoff with heavy concentrations of sediment. Associated impacts may include: alteration of soil hydrology; trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable Ute ladies'-tresses habitats. Land treatments may lead to short-term increased soil erosion, and storm water runoff with heavy concentrations of sediment. Associated impacts may include: alteration of soil hydrology; trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Management activities occurring under this program may increase foot traffic, motorized presence, and vegetation treatments in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance; soil erosion and compaction; impacts from herbicides; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, improve habitat for wildlife and fisheries, and provide habitats for threatened and endangered species. Due to the generality of activities under this program, they also occur under other programs. Due to the many different species in the Field Office area, BLM is likely to encounter management situations where there are species' with conflicting habitat requirements. Therefore, it is likely that a management activity beneficial for one species may not be beneficial for other species.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments,

and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in Ute ladies'-tresses suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Cumulative Effects

Cumulative effects include future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the Ute ladies'-tresses under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' critical, suitable, or potential habitat;
- Management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah;
 - County Governments in Utah;
 - Local Governments in Utah; and
 - Private landholders in Utah.

Ute ladies'-tresses occur primarily within BLM management boundaries. In these areas, Ute ladies'-tresses locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. Ute ladies'-tresses are susceptible to activities on State and private lands. Many of these activities, such as livestock grazing, oil and gas exploration and development, human population expansion and associated infrastructure (increased trails and roads), research, and recreation activities (e.g. off-road vehicles), are expected to continue on State and private lands within the Ute ladies'-tresses range. In addition, illegal collection is reasonably certain to occur. Contributing as cumulative effects to the proposed action, all these activities will continue to affect Ute ladies'-tresses populations by decreasing abundance, injuring plants, adversely affecting pollinators, and further adversely impacting occupied and suitable habitat.

Conclusions

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the current status of the Ute ladies'-tresses, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the Vernal BLM Field Office Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the Ute ladies'-tresses. Critical habitat has not been designated for this species. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the BLM Resource Management Plan. If project design can not adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed BLM Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Uinta Basin hookless cactus (*Sclerocactus glaucus*)

Status of the Species

Species Description

Uinta Basin hookless cactus (*S. glaucus*) is a member of the small cactus genus *Sclerocactus*. Specimens of this species from the Grand Valley of Colorado were initially described as *Echinocactus glaucus* in 1898 by Karl Schumann. Several other specimens of this species, all from Colorado's Grand Valley were subsequently described in the scientific literature: *Echinocactus subglaucus* (Rydberg in 1917), *Sclerocactus whipplei* var. *glaucus* (Purpus 1925) and *Sclerocactus franklinii* (Evans 1939). The Uinta basin hookless cactus was listed as threatened under the Endangered Species Act of 1973, as amended (ESA), on October 11, 1979 (USFWS 1979).

In the 1930's Edward Graham collected "*Sclerocactus whipplei*" and "*Utahia sileri*" specimens in Utah's Uinta Basin. These along with the Colorado plants were included by Lyman Benson in his 1966 monograph on the genus *Sclerocactus*, as *Sclerocactus glaucus*. The USFWS followed this taxonomic treatment when the Uinta Basin hookless cactus (*S. glaucus*) was listed as a threatened species in 1979 (USFWS 1979).

Taxonomic changes continued after *Sclerocactus glaucus*' listing in 1979. Of importance is Fritz Hochstätter's description and publication of *Sclerocactus wetlandicus* in 1989. He describes this species as occurring in northeast Utah in habitat around the Pariette Wetlands. In 1993, he recognized a variety, which he named *ilseae*. He describes this variety as maintaining a relatively small form with extremely short spination. Also recognizing a distinctive entity in the Pariette Draw, Kenneth D. Heil and J. Mark Porter published *Sclerocactus brevispinus* in 1994. *S. brevispinus* is distinctive, due largely to its globose stems, short spines, and small flowers.

S. wetlandicus and *S. brevispinus* comprise distinct morphological forms of *S. glaucus*. Genetics research is ongoing (Hochstätter 1989, 1993 cited in Heil and Porter 2004; Porter et al. 2006). The USFWS recognizes these two species as threatened under *S. glaucus*'s original listing as threatened, and have proposed a revision to recognize *S. wetlandicus* and *S. brevispinus* as threatened under their now recognized scientific names (72 FR 53211 September 18, 2007).

Sclerocactus wetlandicus (The Utah form of typical *S. glaucus*) is a photosynthesizing green plant with succulent unbranched stems usually 3 to 9 cm diameter and 4 to 12 cm tall varying from spheric to elongated cylindrical in shape. The succulent stem has 12 to 14 ribs spirally aligned on the plant body with tubercles bearing spines. Spines are borne in clusters on areoles at the apex of the rib tubercles. The spines are of three types: 6 to 10 strait radial spines 6 to 20 mm long are borne at the margin of areole, 3 to 4 central strait spines similar to radial spines but borne in central portion of the areole around the, usually large single (sometimes 2 or lacking) abaxial spine 15 to 29 mm long and thicker than the other spines the abaxial spine is strait or gently curved (very rarely hooked). (Hooked abaxial spines are the norm in all *Sclerocactus* species except *S. glaucus* and *S. wetlandicus*). Flowers are funnellform 2 to 4 centimeters wide and 2.5 to 5 centimeters high. The sepals and petals are collectively called tepals in cacti. The outer tepals are oblanceolate about 15 mm wide and 20 to 50 mm long with broad brownish lavender midstripe and pink to violet margins. The inner tepals are oblanceolate to lanceolate 17 to 25 mm wide and 30 to 60 mm long pink or violet. The stigma has 6 lobes and it and the style is pinkish yellow. Filaments are green to white and anthers are yellow. The Fruit is ovoid to barrel shaped reddish or reddish grey when ripe 7 to 12 millimeters wide and 9 to 25 mm long. Seeds are black 1.5 millimeters wide 2.5 millimeters long (Hochstätter 1993, cited in Heil and Porter 1994).

Sclerocactus brevispinus (The short spined form Utah form of *S. glaucus*) is a photosynthesizing green plant with succulent unbranched stems usually 1.8 to 7 cm diameter and 2.5 to 8 centimeters tall varying from depressed spheric to shortened cylindrical in shape. The succulent stem has about 13 ribs spirally aligned on the plant body with tubercles bearing spines. Spines are borne in clusters on areoles at the apex of the rib tubercles. The spines are of three types: 6 to 7 strait radial spines 5 to 15 mm long are borne at the margin of areole, 0 to 2 lateral strait central spines similar to radial spines but borne in central portion of the areole around the usually small single (sometimes lacking) abaxial spine 1 to 5 mm long and thicker than the other spines

the abaxial spine is hooked (in specimens with 1 to 2 mm central long spines the spine hook reflexes back to the surface of the areole) are shorter. Flowers are campanulate about 1.1 to 3 centimeters wide and 2 to 3 centimeters high. The outer tepals are oblanceolate about 6 millimeters wide and 15 millimeters long with broad brownish midstripe and pink to purple margins. The inner tepals are oblanceolate to lanceolate 10 to 22 millimeters wide and 30 to 60 millimeters long purple. The stigma has 6 lobes and it and the style is pinkish yellow. Filaments are white to green to pinkish purple and anthers are yellow. The Fruit is shortened barrel shaped reddish or reddish grey when ripe 7 to 12 mm wide and 9 to 25 mm long. Seeds are black 1.8 to 2.7 millimeters wide 2.5 to 3.8 millimeters long. (Species descriptions adapted from Hochstätter 1993).

Life History and Population Dynamics

The Uinta Basin hookless cactus is a slow-growing species (Rechel et al. 1999). Reproduction is sexual. Flowering occurs from April to May and fruiting occurs from May to June. Bees, flies, beetles, and ants have been observed visiting Uinta basin hookless cactus flowers, however, the effective pollination vectors are not clearly understood (USFWS 1990). Seed dispersal is possibly a limiting factor in the distribution of the species. Seed dispersal is accomplished primarily by ants (Rechel et. al. 1999), but may also occur via rain and water flow, other insects, birds, and rodents (USFWS 1990). Seed dispersal is possibly a limiting factor in the distribution of the species. Factors which govern the distribution of Uinta Basin hookless cactus and long-term population dynamics are poorly understand (USFWS 1990).

Status and Distribution

Populations and suitable habitat for the Uinta Basin hookless cactus occur within the administrative boundaries of BLM's Vernal Field Office and Price Field Office. The cactus is found in the Uinta Basin of northeastern Utah and the upper Colorado and Gunnison River valleys of western Colorado. In Colorado, there are two population centers of Uinta Basin hookless cactus which occur in the Upper Colorado and Gunnison River valleys of western Colorado. These population centers occur on alluvial river terraces of the Gunnison River from near Delta, Colorado, to southern Mesa County, Colorado; and on alluvial river terraces of the Colorado River and in the Plateau and Roan Creek drainages in the vicinity of DeBeque, Colorado (USFWS 1990).

In Utah, the Uinta Basin hookless cactus is found within one major population center composed of three important population groups. Each of these three population groups occur within the BLM Diamond Mountain planning area, with one of the three populations extending into the Book Cliffs planning area and one extending into the Price River planning area. Specifically, the three Utah populations are found within the following areas and habitats:

- on alluvial river terraces near the confluence of the Green, White, and Duchesne rivers including Ouray National Wildlife Refuge and the town of Ouray, Utah, south along the Green River, to the vicinity of Sand Wash including concentrations near the mouth of Pariette Draw;
- along the base of the Badlands Cliffs in extreme southeastern Duchesne County; and

- a small population of a morphologically distinct form (*S. brevispinus*) growing on the Clay badlands in the Pariette Draw drainage south of Myton, Utah, which gradates into the more typical Uinta Basin hookless cactus near the mouth of Pariette Draw south of Ouray, Utah (USFWS 1990).

There are additional populations east along the White River drainage and a disjunct population near Bonanza, Utah.

S. wetlandicus generally occurs on cobblely, gravelly, or rocky surfaces on river terrace deposits and lower mesa slopes. The morphologically distinct form, *S. brevispinus*, occurs on badlands in the Pariette Draw drainage, derived from the Wagonhound member of the Uinta geologic formation.

S. glaucus occurs on varying exposures, but is more abundant on south facing exposures, and on slopes to about 30 percent grade; it is most abundant at the point where terrace deposits break from level tops to steeper side slopes. The species is found at an elevational range of 4,500 to 5,900 feet.

Vegetation type of the species' habitat is comprised of desert scrub dominated by shadscale (*Atriplex confertifolia*), galleta (*Hilaria jamesii*), black-sage (*Artemisia nova*), and Indian rice grass (*Stipa hymenoides*). Other important species include two similar spherical or cylindrical cactus species, strawberry hedgehog cactus (*Echinocereus triglochidiatus* var. *melanacanthus*) and Simpson's pincushion cactus (*Pediocactus simpsonii*). Other important species in the plant community include the prickly pear cactus (*Opuntia polyacantha*), winterfat (*Krascheninnikovia lanata*), yucca (*Yucca harrimaniae*), snakeweed (*Gutierrezia sarothrae*), low rabbitbrush (*Crysothamnus viscidiflorus*), sand dropseed (*Sporobolus cryptandrus*), and Salina wildrye (*Elymus salinus*) (USFWS 1990).

Environmental Baseline

Status of the Species within the Action Area

In 1985, BLM completed Uinta Basin hookless cactus surveys in the Pariette Wash area. Surveys resulted in the creation of a "special status plant boundary" and an Area of Critical Environmental Concern (ACEC). According to the Biological Assessment, approximately 759,724 acres of potentially suitable habitat exists within the Vernal and Price Field Offices.

The Uinta Basin hookless cactus has been documented within the Desolation Canyon Wilderness Study Area (WSA) along the Green River Corridor (W. Ludington, BLM, pers. comm., May 2003). Occupied and suitable habitat is located along a portion of the Green River where public access is limited by topography and roads.

The total population of *Sclerocactus brevispinus* on the Uintah and Ouray Reservation of the Ute Tribe, directly north and adjacent to BLM lands, is unknown. The Ute Tribe conducted an inventory in 2007 and preliminary results indicate a population of 5806 individuals in this current project area of proposed oil and gas drilling within the Pariette Draw drainage (O'Hearn 2007). We estimate the total area of potential habitat for *S. brevispinus* on Ute Tribal lands,

based on exposures of the Wagon Hound member with desert shrub vegetation, to be about 1,200 ha (3,000 ac) (USFWS 2007).

Factors Affecting Species Environment within the Action Area

Range-wide activities with the greatest potential to adversely affect Uinta basin hookless cactus populations and habitats include: livestock grazing (trampling); off-highway vehicle use; energy and mineral exploration and development; stone collecting; the use of insecticides and herbicides; and illegal collection (USFWS 1990). In addition to these human-induced threats, several natural threats to the continued conservation of the species include: disease, parasitism, predation, drought, erosion, trampling by wildlife, and vegetative competition (USFWS 1990).

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for cultural resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in Uinta basin hookless cactus habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for fossil resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in Uinta basin hookless cactus habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Fire and Fuels Management

Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression

methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Although the BLM does not propose to carry out prescribed fire or non-fire treatments (mechanical and chemical) within suitable habitat for the Uinta basin hookless cactus, wildland fire suppression activities could adversely affect the Uinta Basin hookless cactus. Activities under this program may result in increased foot or motorized traffic and application of chemicals (fire retardants, pesticides, insecticides) in suitable Uinta basin hookless cactus habitats. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Lands and Realty

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities authorized under this program may adversely impact Uinta Basin hookless cactus with human- and equipment-related soil disturbances. Soil disturbance, erosion, and compaction may impact individual plants, modify or degrade suitable habitat, reduce pollinator populations, and reduce the seed bank. Land exchanges may result in fragmentation or degradation of potential Uinta Basin hookless cactus habitat. As a result, there may be loss or degradation of cactus populations; decreased recruitment; and increased occurrence of plant damage and individual mortality.

Livestock Grazing

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder other species within the habitat: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Activities occurring under this program may increase and concentrate domestic ungulate presence; increase motorized traffic; and surface disturbance from fence and livestock pond construction in Uinta basin hookless cactus suitable habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program may result in increased foot traffic and motorized traffic, significant soil disturbance; increased energy development of facilities, and increased mineral excavation in Uinta basin hookless cactus habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; loss, modification, or degradation of suitable habitat; reduced seed banks; loss of pollinator populations; increased occurrences of invasive plant species; and increased occurrence of illegal collection due to increased human access due to increased human access. As a result, there may be loss or degradation of cactus populations; decreased Uinta Basin hookless cactus seed production; decreased recruitment; and increased occurrence of plant damage or individual mortality.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Activities occurring under this program may increase human, horse, and motorized traffic in Uinta basin hookless cactus suitable habitat. Associated impacts from these activities include trampling or crushing of individuals, illegal collection of individuals due to increased human access, loss, modification or degradation to suitable habitat, reduced seed banks, and increased occurrences of invasive plant species. As a result, there may be decreased recruitment, and increased occurrence of plant damage or individual mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable Uinta Basin hookless cactus habitats. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable Uinta Basin hookless cactus habitats. Land treatments may lead to short-term increased soil erosion, and storm water runoff with heavy concentrations of sediment. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Management activities occurring under this program may increase foot traffic, motorized presence, and vegetation treatments in Uinta basin hookless cactus suitable habitat. Associated impacts include trampling or crushing of individuals, loss, modification or degradation of suitable habitat, reductions in seed banks, reduced pollinator populations, and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Because the proposed action calls for removal of horse populations, the main management activity under this program is herd gathering.

Activities occurring under this program may increase foot traffic and motorized traffic related to herd gathering and holding pen construction activities in Uinta basin hookless cactus suitable habitat. Herd gathering intentionally concentrates horses, further disturbing habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, support UDWR Herd Management Plans, improve habitat on for wildlife and fisheries, and provide habitats for threatened and endangered species.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in Uinta Basin hookless cactus suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Although activities authorized under this program are not likely to occur in Uinta Basin hookless cactus habitat, there is some potential for private individuals to trample Uinta Basin hookless cactus individuals while harvesting wood products. Known populations of Uinta Basin hookless cactus, and potential habitats have not been specifically protected from fuel wood, Christmas tree, and post and pole harvesting. As a result, there may be decreased seed production; decreased recruitment; increased illegal collection of individuals due to increased human access; and increased occurrence of plant damage or individual mortality.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in Uinta Basin hookless cactus suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the Uinta Basin hookless cactus under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' suitable or potential habitat;
- Encroachment of human development into a species' critical, suitable, or potential habitat; and
- Management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah;
 - County Governments in Utah;
 - Local Governments in Utah; and
 - Private landholders in Utah.

Uinta Basin hookless cacti occur primarily within BLM management boundaries. In these areas, Uinta Basin hookless cactus locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. Uinta Basin hookless cacti are susceptible to activities on State and private lands. Many of these activities, such as livestock grazing, oil and gas exploration and development, research, human population expansion and associated infrastructure (increased trails and roads), and recreation activities (e.g. off-road vehicles), are expected to continue on State and private lands within the Uinta Basin hookless cactus' range. In addition, illegal collection is reasonably certain to occur. Contributing as cumulative effects to the proposed action, all these activities will continue to affect Uinta Basin hookless cactus populations by decreasing abundance, injuring plants, adversely affecting pollinators, and further adversely impacting occupied and suitable habitat.

Conclusions

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the current status of the Uinta Basin hookless cactus, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the Proposed VFO Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the Uinta Basin hookless cactus. Critical habitat has not been designated for this species. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the Resource Management Plan. If project design can not adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Clay reed-mustard (*Schoenocrambe argillacea*)

Status of the Species

Species / Critical Habitat Description

Duane Atwood first discovered the Clay reed-mustard in 1976 in the southern portion of the Uinta Basin in Utah. Clay reed-mustard is a perennial herbaceous plant with sparsely leafed stems 15 to 30 cm (6 to 12 inches) tall arising from a woody root crown. The leaves are very narrow with a smooth margin, 10 to 35 mm (0.4 to 1.4 inches) long and usually, less than 2 mm (0.1 inch) wide. The leaf blades are alternately arranged on the stem and, for the most part, are attached directly to the stem without a petiole. The flowers have petals that are pale lavender to whitish with prominent purple veins and measure 8 to 11 mm (0.3 to 0.4 inch) long and 3.5 to 4.5 mm (0.14 to 0.18 inch) wide. The entire flowers are about 1 cm (0.4 inch) across in full anthesis and are displayed in a raceme of 3 to 20 flowers at the end of the plant's leafy stems.

Life History and Population Dynamics

Clay reed-mustard flowers are purple-veined, white, or lilac and are hairless. Blooming occurs from mid-April through mid-May (Franklin 1993, USFWS 1994). The clay reed-mustard reproduces sexually. Specific information on pollination mechanisms and vectors for the species is limited (USFWS 1994).

Status and Distribution

On January 14, 1992, *S. argillacea* was listed as threatened under the Endangered Species Act of 1973, as amended (ESA). Primary identified threats included oil and gas and oil shale development (57 FR 1398 1403).

The clay reed-mustard is endemic to clay soils derived from the zone of contact between the Uinta and Green River geologic formations, Uinta Basin, Uintah County, Utah. The clay reed-mustard typically grows on at-the-surface bedrock, scree, and fine-textured soils derived from the Evacuation Creek member of the Green River Formation. The species has also been documented below the rocky contact zone of the Uintah Formation and the Evacuation Creek Member. The species most commonly occurs on steep north-facing slopes, at elevations ranging from 4,721 to 5,790 feet (1,439 to 1,765 meters) (Franklin 1993). Clay reed-mustard is also associated with the mixed desert shrub community. Dominant shrub species associated with clay reed-mustard populations include Utah serviceberry, black sagebrush (*A. nova*), Castle Valley clover (*A. gardneri cuneata*), shadscale saltbush, and green rabbitbrush (*C. viscidiflorus*) (Franklin 1993, USFWS 1994).

Environmental Baseline

Status of the Species within the Action Area

The entire population of this species is found in the action area. The clay reed-mustard is narrowly distributed and has extremely low population numbers.

Factors Affecting Species Environment within the Action Area

The clay reed-mustard was listed as threatened because it was susceptible to threats posed by oil and gas development and oil shale development. Clay reed-mustard populations are highly vulnerable to any activity within their habitat.

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for cultural resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in clay reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for fossil resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in clay reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Fire and Fuels Management

Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Although the BLM does not propose to carry out prescribed fire or non-fire treatments (mechanical and chemical) within suitable habitat for the clay reed-mustard, wildland fire suppression activities could adversely affect the clay reed-mustard. Activities under this program may result in increased foot or motorized traffic and application of chemicals (fire retardants, pesticides, insecticides) in suitable clay reed-mustard habitats. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Lands and Realty

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities authorized under this program may adversely impact clay reed-mustard with human- and equipment-related soil disturbances. Soil disturbance, erosion, and compaction may impact individual plants, modify or degrade suitable habitat, reduce pollinator populations, and reduce the seed bank. Land exchanges may result in fragmentation or degradation of potential clay reed-mustard habitat. As a result, there may be loss or degradation of cactus populations; decreased recruitment; and increased occurrence of plant damage and individual mortality.

Livestock Grazing

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock

management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder other species within the habitat: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Activities occurring under this program may increase and concentrate domestic ungulate presence; increase motorized traffic; and surface disturbance from fence and livestock pond construction in clay reed-mustard suitable habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program may result in increased foot traffic and motorized traffic, significant soil disturbance; increased energy development of facilities, and increased mineral excavation in clay reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; loss, modification, or degradation of suitable habitat; reduced seed banks; loss of pollinator populations; increased occurrences of invasive plant species; and increased occurrence of illegal collection due to increased human access due to increased human access. As a result, there may be loss or degradation of cactus populations; decreased clay reed-mustard seed production; decreased recruitment; and increased occurrence of plant damage or individual mortality.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the

public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Activities occurring under this program may increase human, horse, and motorized traffic in clay reed-mustard suitable habitat. Associated impacts from these activities include trampling or crushing of individuals, illegal collection of individuals due to increased human access, loss, modification or degradation to suitable habitat, reduced seed banks, and increased occurrences of invasive plant species. As a result, there may be decreased recruitment, and increased occurrence of plant damage or individual mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable clay reed-mustard habitats. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable clay reed-mustard habitats. Land treatments may lead to short-term increased soil erosion, and storm water runoff with heavy concentrations of sediment. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual

resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Management activities occurring under this program may increase foot traffic, motorized presence, and vegetation treatments in clay reed-mustard suitable habitat. Associated impacts include trampling or crushing of individuals, loss, modification or degradation of suitable habitat, reductions in seed banks, reduced pollinator populations, and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Because the proposed action calls for removal of horse populations, the main management activity under this program is herd gathering.

Activities occurring under this program may increase foot traffic and motorized traffic related to herd gathering and holding pen construction activities in clay reed-mustard suitable habitat. Herd gathering intentionally concentrates horses, further disturbing habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, support UDWR Herd Management Plans, improve habitat on for wildlife and fisheries, and provide habitats for threatened and endangered species.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in clay reed-mustard suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal

access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Although activities authorized under this program are not likely to occur in clay reed-mustard habitat, there is some potential for private individuals to trample clay reed-mustard individuals while harvesting wood products. Known populations of clay reed-mustard, and potential habitats have not been specifically protected from fuel wood, Christmas tree, and post and pole harvesting. As a result, there may be decreased seed production; decreased recruitment; increased illegal collection of individuals due to increased human access; and increased occurrence of plant damage or individual mortality.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in clay reed-mustard suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the clay reed-mustard under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' suitable or potential habitat;
- Encroachment of human development into a species' critical, suitable, or potential habitat; and
- Management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah;
 - County Governments in Utah;
 - Local Governments in Utah; and
 - Private landholders in Utah.

The clay reed-mustard occurs primarily within BLM management boundaries. In these areas, clay reed-mustard locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. The clay reed-mustard is susceptible to activities on State and private lands. Many of these activities, such as livestock grazing, oil and gas exploration and development, research, human population expansion and associated infrastructure (increased trails and roads), and recreation activities (e.g. off-road vehicles), are expected to continue on State and private lands within the clay reed-mustard's range. Contributing as cumulative effects to the proposed action, all these activities will continue to affect clay reed-mustard populations by decreasing abundance, injuring plants, adversely affecting pollinators, and further adversely impacting occupied and suitable habitat.

Conclusions

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the current status of the clay reed-mustard, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the Proposed VFO Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the clay reed-mustard. Critical habitat has not been designated for this species. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the Resource Management Plan. If project design can not adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

Shrubby reed-mustard (*Schoenocrambe suffrutescens*)

Status of the Species

Species Description

Glaucocarpum (= *Schoenocrambe*) *suffrutescens* was first discovered in 1935 by Edward Graham and described by Reed Rollins as *Thelypodium suffrutescens* (Graham 1937; 52 FR 37416, October 6, 1987). In 1937, Dr. Rollins renamed this species *Glaucocarpum suffrutescens* (Rollins 1938; 52 FR 37416, October 6, 1987).

Glaucocarpum (= *Schoenocrambe*) *suffrutescens* was listed as an endangered species under the authority of the Endangered Species Act of 1973, as amended, on October 6, 1987 (52 FR 37416, October 6, 1987) under the name of toad-flax cress. In 1985, Welsh and Chatterley renamed this species *Schoenocrambe suffrutescens*. The common name was changed from toad-flax cress to shrubby reed-mustard, and the genus was changed from *Glaucocarpum* to *Schoenocrambe* on January 14, 1992 (57 FR 1398). Although other name changes have been proposed, the USFWS

still recognizes shrubby reed-mustard as *Schoenocrambe suffrutescens* (Mark Porter, Rancho Santa Anna Botanical Gardens, pers. comm. 2005; Al-Shehbaz 2005).

The shrubby reed-mustard (*Schoenocrambe suffrutescens*) is a perennial herb in the mustard family (Brassicaceae). The clumped stems are 10 to 25 cm (4 to 12 inches) tall arising from a branching woody root crown. The leaves are entire with a smooth margin, 1.0 to 2.5 cm (0.4 to 1 inch) long and 0.3 to 1.0 cm (0.12 to 0.4 inch) wide. The leaf blades are alternately arranged on the stem and are attached to the stem by a short petiole. The shrubby reed-mustard flowers have petals that are light yellow or greenish yellow and spatulately shaped measuring about 10 mm (0.4 inch) long and 3 mm (0.12 inch) wide. The entire flowers are displayed in a raceme of, commonly, 5 to 20 flowers at the end of the plant's leafy stems (Rollins 1938; Welsh and Chatterley 1985; Welsh *et al.* 1987).

Life History and Population Dynamics

Flowering occurs from April to May and fruiting occurs May to June (USFWS 1994). Reproduction is sexual (USFWS 1994). Pollinator exclusion experiments demonstrated that the shrubby reed-mustard is capable of automatic self-pollination (autogamy), but that significantly fewer seeds are set than when open pollination (assumed to be primarily cross-pollination) occurs (Tepedino and Bowlin; USFWS 1994). The following prospective pollinators, all native bee species, were captured while foraging on the flowers: *Dialictus perdificilis*, *D. sedi*, *Evyllaes pulveris* (all Halictidae), and *Andrena walleyi* (Andrenidae) (Tepedino and Bowlin; USFWS 1994).

Shrubby reed-mustard plants produce a few (four) to many (over one hundred) inflorescences each year. The five to twenty flowers on each inflorescence open acropetally (Tepedino and Bowlin; USFWS 1994). Flowers are fragrant in the mornings, but the fragrance declines throughout the day, and over the bloom time of each flower (3-5 days) (Tepedino and Bowlin; USFWS 1994).

Status and Distribution

The factors which govern the distribution of shrubby reed-mustard are not well known, nor are the long-term population dynamics (USFWS 1994). The species currently occurs in 3 metapopulations with 7 total populations. It is unknown whether or not these populations have become genetically isolated or whether pollinators are able to travel between the populations to ensure genetic viability (L. England, personal comm.).

The effect of natural factors, such as disease, parasitism, grazing by native species, natural erosion, and vegetative competition, on the viability of the species population is not known. From 1935 when the species was first discovered to 1987 when the species was listed, the population experienced a decline in population size and range (Graham 1937; 52 FR 37416, 10/6/1987). The reasons for the population decline are not well understood, but the practice of mining building stone within occupied habitat is thought to be a major contributor as is winter sheep grazing (USFWS 1994, Franklin 1995).

The shrubby reed-mustard species is only found in Uintah and Duchesne Counties, Utah. The species grows along semi-barren, white shale, layers derived from the Evacuation Creek Member

of the Green River Formation, primarily on a calcareous shale stratum (57 FR 1398 1403). Habitat is found in xeric, shallow, fine textured soils intermixed with shale fragments on level to moderately sloping grounds of disjunct knolls and benches (USFWS 1992, Franklin 1993, USFWS 1994). The species is associated with mixed desert shrub and pinyon-juniper communities, at elevations ranging from 1554 to 2042 meters (5098 to 6699 feet) (Franklin 1993). Dominant shrub species associated with shrubby reed-mustard populations include, pygmy sagebrush (*Artemisia pygmaea*), saltbush (*Atriplex spp.*), and mountain mahogany (*Cercocarpus montanus*). Many of the shrub and herbaceous species found near shrubby reed-mustard populations are also endemic to the Uinta Basin (Franklin 1993, USFWS 1994).

Environmental Baseline

Status of the Species within the Action Area

The Vernal field office contains the entire range this species. Shrubby reed-mustard occurs in three meta-populations in Uintah and Duchesne Counties:

- Gray Knolls meta-population: centered in the Gray Knolls between the Green River and Hill Creek,
- Pack Mountain meta-population: centered on Little Pack Mountain and the slopes of Big Pack Mountain between Hill Creek and Willow Creek, and
- Badlands Cliff meta-population: the only one in Duchesne County and is at the base of the Badlands cliff above the Wrinkles Road (Service 1994b).

Approximately 7 distinct populations of shrubby reed-mustard are known to occur within these metapopulations. Of these, one population occurs within the Diamond Mountain planning area in southeastern Duchesne County. The remaining six populations occur in the Book Cliffs planning area in southern Uintah County. Two of the Uintah County populations also extend onto the Uintah and Ouray Indian Reservation (UNHP 2003).

The shrubby reed-mustard has low to extremely low numbers varying between years and at times falling below 100 adults (NatureServe 2005). The population fluctuates and at least occasionally approaches sub-viable levels. Based in part on Shultz and Mutz's (1979) and Franklin's (1995) surveys, the Service estimated that the Gray Knolls meta-population contained about 1,000 plants, the Pack Mountain meta-population was estimated to contain about 3,000 plants, and the Badlands Cliff meta-population was estimated to contain roughly 1,000 scattered plants (Service 1994b). The Thorn Ranch population was the type locality for the species located in 1935 by Graham and in 1937 by Rollins. In a personal communication between R. Rollins and L. England (BLM botanist at the time), Rollins commented that the population along the eastern slopes of Big Pack Mountain were in the hundreds of thousands in 1937 (L. England 1980). By 1994, this population had been reduced to the extent that it was not relocated in Franklin's 1994 survey (Franklin 1995). Population numbers appear to coincide with rainfall amounts during the months of May-June.

Factors Affecting Species Environment within the Action Area

Threats to the species include oil and gas development, winter sheep grazing, off-road vehicle use, and land management practices (52 FR 37416; Service 1994b; Franklin 1995). At the time

of listing in 1987, building stone collection was thought to have significantly altered the habitat of the species and decreased its range and population (52 FR 37416). The species habitat is also underlain by oil-shale deposits that have been identified as the most geologically prospective oil shale resources (BLM 2008). These threats combined are likely to endanger the continued existence of this species (52 FR 37416; Service 1994b).

Effects of the Action

Cultural Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for cultural resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in shrubby reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Paleontological Resources

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Activities under this program include minor surface disturbance for fossil resource excavations. Activities under this program may increase localized foot traffic, motorized traffic, and use of tools in shrubby reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Fire and Fuels Management

Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Although the BLM does not propose to carry out prescribed fire or non-fire treatments (mechanical and chemical) within suitable habitat for the shrubby reed-mustard, wildland fire

suppression activities could adversely affect the shrubby reed-mustard. Activities under this program may result in increased foot or motorized traffic and application of chemicals (fire retardants, pesticides, insecticides) in suitable shrubby reed-mustard habitats. These activities may cause trampling or crushing of individuals; increased soil disturbance; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment, increased plant damage or individual mortality, and a potential for long-term population declines.

Lands and Realty

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities authorized under this program may adversely impact shrubby reed-mustard with human- and equipment-related soil disturbances. Soil disturbance, erosion, and compaction may impact individual plants, modify or degrade suitable habitat, reduce pollinator populations, and reduce the seed bank. Land exchanges may result in fragmentation or degradation of potential shrubby reed-mustard habitat. As a result, there may be loss or degradation of cactus populations; decreased recruitment; and increased occurrence of plant damage and individual mortality.

Livestock Grazing

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Range management activities may include vegetation treatments such as prescribed fire, mechanical and chemical control of noxious weeds, sagebrush and other target species. The determinations and effects analyses associated with the potential impacts of these treatments can be located under the other appropriate program headings (i.e., fire treatments – see Fire Management, or vegetative treatments – see Vegetation Management). Other range improvements authorized by the livestock grazing management program may include fence construction, water developments, exclosures, and livestock handling facilities.

There are four primary ways livestock manipulate habitats to favor/hinder other species within the habitat: 1) alteration of vegetation composition, 2) cause increased/decreased productivity of selected plant species, 3) increase/decrease the nutritive quality of available forage, and/or 4) increase/decrease the diversity of habitats by altering structure (Severson and Urness 1994).

Activities occurring under this program may increase and concentrate domestic ungulate presence; increase motorized traffic; and surface disturbance from fence and livestock pond construction in shrubby reed-mustard suitable habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program may result in increased foot traffic and motorized traffic, significant soil disturbance; increased energy development of facilities, and increased mineral excavation in shrubby reed-mustard habitat. These activities may cause trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; loss, modification, or degradation of suitable habitat; reduced seed banks; loss of pollinator populations; increased occurrences of invasive plant species; and increased occurrence of illegal collection due to increased human access due to increased human access. As a result, there may be loss or degradation of cactus populations; decreased shrubby reed-mustard seed production; decreased recruitment; and increased occurrence of plant damage or individual mortality.

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about BLM's recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Activities occurring under this program may increase human, horse, and motorized traffic in shrubby reed-mustard suitable habitat. Associated impacts from these activities include trampling or crushing of individuals, illegal collection of individuals due to increased human access, loss, modification or degradation to suitable habitat, reduced seed banks, and increased occurrences of invasive plant species. As a result, there may be decreased recruitment, and increased occurrence of plant damage or individual mortality.

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order

to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable shrubby reed-mustard habitats. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase localized foot traffic, motorized traffic, and use of tools and heavy machinery in suitable shrubby reed-mustard habitats. Land treatments may lead to short-term increased soil erosion, and storm water runoff with heavy concentrations of sediment. Associated impacts may include: trampling or crushing of individuals; increased soil disturbance; soil erosion and compaction; removal, degradation, or alteration of key habitat; reduced seed banks; reduced pollinator populations; and increased occurrence of invasive plant species. As a result, there may be decreased recruitment and increased plant damage or individual mortality.

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Management activities occurring under this program may increase foot traffic, motorized presence, and vegetation treatments in shrubby reed-mustard suitable habitat. Associated impacts include trampling or crushing of individuals, loss, modification or degradation of suitable habitat, reductions in seed banks, reduced pollinator populations, and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Because the proposed action calls for removal of horse populations, the main management activity under this program is herd gathering.

Activities occurring under this program may increase foot traffic and motorized traffic related to herd gathering and holding pen construction activities in shrubby reed-mustard suitable habitat. Herd gathering intentionally concentrates horses, further disturbing habitat. These activities may increase the occurrence of trampling or crushing of individuals, increase soil disturbance, soil compaction and erosion; increase occurrence of exotic plant species; reduce pollinator populations and remove, modify or degrade suitable habitat. As a result, there may be increased occurrence of plant damage or individual mortality and loss of habitat.

Wildlife and Fisheries Management

This program aims to maintain biological diversity, support UDWR Herd Management Plans, improve habitat on for wildlife and fisheries, and provide habitats for threatened and endangered species.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in shrubby reed-mustard suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Although activities authorized under this program are not likely to occur in shrubby reed-mustard habitat, there is some potential for private individuals to trample shrubby reed-mustard individuals while harvesting wood products. Known populations of shrubby reed-mustard, and potential habitats have not been specifically protected from fuel wood, Christmas tree, and post and pole harvesting. As a result, there may be decreased seed production; decreased recruitment; increased illegal collection of individuals due to increased human access; and increased occurrence of plant damage or individual mortality.

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Activities occurring under this program may increase foot traffic, motorized traffic, and/or significant soil disturbance in shrubby reed-mustard suitable habitat. These activities may cause trampling or crushing of individuals, increased soil disturbance, erosion, and compaction; removal of suitable habitat; loss, modification or degradation of suitable habitat; reduced seed banks; reduced pollinator populations; and increased occurrences of invasive plant species. As a result, there may be decreased seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to the shrubby reed-mustard under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns or practices that adversely affect a species' suitable or potential habitat;
- Encroachment of human development into a species' critical, suitable, or potential habitat; and
- Management actions by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah;
 - County Governments in Utah;
 - Local Governments in Utah; and
 - Private landholders in Utah.

Shrubby reed-mustard cacti occur primarily within BLM management boundaries. In these areas, shrubby reed-mustard locations are surrounded by a checkerboard pattern of land ownership including Federal, State, and private landowners. The shrubby reed-mustard is susceptible to activities on State and private lands. Many of these activities, such as livestock grazing, oil and gas exploration and development, research, human population expansion and associated infrastructure (increased trails and roads), and recreation activities (e.g. off-road vehicles), are expected to continue on State and private lands within the shrubby reed-mustard' range. Contributing as cumulative effects to the proposed action, all these activities will continue to affect shrubby reed-mustard populations by decreasing abundance, injuring plants, adversely affecting pollinators, and further adversely impacting occupied and suitable habitat.

Conclusions

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the conservation measures that were incorporated into the project design.

After reviewing the current status of the shrubby reed-mustard, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's biological opinion that the Proposed VFO Resource Management Plan, as proposed, is not likely to jeopardize the continued existence of the shrubby reed-mustard. Critical habitat has not been designated for this species. We base our conclusion on the following:

1. The applicant committed resource protection measures will be incorporated into site-specific projects designed under the Resource Management Plan. If project design can not adhere to all applicant committed resource protection measures, consultation under Section 7 of the Endangered Species Act will be initiated.
2. All site-specific projects designed under the proposed Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

COLORADO FISH

Bonytail (*Gila elegans*)

Status of the Species

Species / Critical Habitat Description

Bonytail are medium-sized (less than 600 mm) fish in the minnow family. Adult bonytail are gray or olive colored on the back with silvery sides and a white belly. The adult bonytail has an elongated body with a long, thin caudal peduncle. The head is small and compressed compared to the rest of the body. The mouth is slightly overhung by the snout and there is a smooth low hump behind the head that is not as pronounced as the hump on a humpback chub.

The bonytail is endemic to the Colorado River Basin and was historically common to abundant in warm-water reaches of larger rivers of the basin from Mexico to Wyoming. The species experienced a dramatic, but poorly documented, decline starting in about 1950, following construction of several mainstem dams, introduction of nonnative fishes, poor land-use practices, and degraded water quality (USFWS 2002).

Currently, no self-sustaining populations of bonytail are known to exist in the wild, and very few individuals have been caught anywhere within the basin. An unknown, but small number of wild adults exist in Lake Mohave on the mainstem Colorado River. Since 1977, only 11 wild adults have been reported from the upper basin (Valdez et al. 1994).

A total of 499 km (312 miles) of river has been designated as critical habitat for the bonytail in the Colorado River Basin, representing about 14% of the species' historic range (59 FR 13374). River reaches that have been designated as critical habitat in the Green River extend from the confluence with the Yampa River downstream to the boundary of Dinosaur National Monument

and Desolation and Gray Canyons. In addition, critical habitat has been designated in the Yampa River from the upstream boundary of Dinosaur National Monument to its confluence with the Green River. Within the VFO, critical habitat has been designated in the following sections of the Colorado River Upper Basin (59 FR 13374).

Utah, Uintah County; and Colorado, Moffat County. The Green River from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal Meridian) to the southern boundary of Dinosaur National Monument in T. 6 N., R. 24 E., section 30 (Salt Lake Meridian).

Utah, Uintah and Grand Counties. The Green River (Desolation and Gray Canyons) from Sumner's Amphitheater in T. 12 S., R. 18 E., section 5 (Salt Lake Meridian) to Swasey's Rapid (river mile 12) in T. 20 S., R. 16 E., section 3 (Salt Lake Meridian).

The USFWS has identified water, physical habitat, and the biological environment as the primary constituent elements of bonytail critical habitat (59 FR 13374). Water includes a quantity of water of sufficient quality delivered to a specific location in accordance with a hydrologic regime required for the particular life stage for each species. The physical habitat includes areas of the Colorado River system that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. In addition, oxbows, backwaters, and other areas in the 100-year floodplain, when inundated, provide access to spawning, nursery, feeding, and rearing habitats. Food supply, predation, and competition are important elements of the biological environment. Recent information collected by the Recovery Program suggests that floodplain habitats may be more important to the survival and recovery of the bonytail than the USFWS originally thought.

Life History and Population Dynamics

The bonytail are considered a species that is adapted to mainstem rivers, where it has been observed in pools and eddies (Vanicek 1967, Minckley 1973). Spawning of bonytail has never been observed in a river, but ripe fish were collected in Dinosaur National Monument during late June and early July suggesting that spawning occurred at water temperatures of about 18°C (Vanicek and Kramer 1969). Similar to other closely related *Gila* species, bonytail probably spawn in rivers in spring over rocky substrates; spawning has been observed in reservoirs over rocky shoals and shorelines. It has been recently hypothesized that flooded bottomlands may provide important bonytail nursery habitat. Of five specimens captured most recently in the upper basin, four were captured in deep, swift, rocky canyons (Yampa Canyon, Black Rocks, Cataract Canyon, and Coal Creek Rapid), but the fifth was taken in Lake Powell. Since 1974, all bonytail captured in the lower basin have been caught in reservoirs. The diets of bonytail are presumed similar to that of the humpback chub (USFWS 2002a).

Status and Distribution

Bonytail are endemic to the Colorado River Basin and was historically common to abundant in warm-water reaches of larger rivers of the basin from Mexico to Wyoming. The species experienced a dramatic, but poorly documented, decline starting in about 1950, following construction of several mainstem dams, introduction of nonnative fishes, poor land-use practices, and degraded water quality (USFWS 2002a).

Currently, no self-sustaining populations of bonytail are known to exist in the wild, and very few individuals have been caught anywhere within the basin. An unknown, but small number of wild adults exist in Lake Mohave on the mainstem Colorado River. Since 1977, only 11 wild adults have been reported from the upper basin (Valdez et al. 1994).

Bonytail are the rarest native fish in the Colorado River. Little is known about its specific habitat requirements or cause of decline, because the bonytail was extirpated from most of its historic range prior to extensive fishery surveys. It was listed as endangered on April 23, 1980. Currently, no documented self-sustaining populations exist in the wild. Formerly reported as widespread and abundant in mainstem rivers (Jordan and Evermann 1896), its populations have been greatly reduced. Remnant populations presently occur in the wild in low numbers in Lake Mohave and several fish have been captured in Lake Powell and Lake Havasu (USFWS 2002a). The last known riverine area where bonytail were common was the Green River in Dinosaur National Monument, where Vanicek (1967) and Holden and Stalnaker (1970) collected 91 specimens during 1962-1966. From 1977 to 1983, no bonytail were collected from the Colorado or Gunnison rivers in Colorado or Utah (Wick et al. 1979, 1981; Valdez et al. 1982; Miller et al. 1984). However, in 1984, a single bonytail was collected from Black Rocks on the Colorado River (Kaeding et al. 1986). Several suspected bonytail were captured in Cataract Canyon in 1985-1987 (Valdez 1990). Current stocking plans are planned to continue for at least two more years, however, catch rates indicate stocking will continue until at least 2010 and probably longer (Thomas Czapla, personal communication).

Environmental Baseline

Status of the Species within the Action Area

Bonytail were extirpated between Flaming Gorge Dam and the Yampa River, primarily because of rotenone poisoning and cold-water releases from the dam (USFWS 2002). Surveys from 1964 to 1966 found large numbers of bonytail in the Green River in Dinosaur National Monument downstream of the Yampa River confluence (Vanicek and Kramer 1969). Surveys from 1967 to 1973 found far fewer bonytail (Holden and Stalnaker 1975a). Few bonytail have been captured after this period, and the last recorded capture in the Green River was in 1985 (USFWS 2002). Bonytail are so rare that it is currently not possible to conduct population estimates. A stocking program is being implemented to reestablish populations in the upper Colorado River basin.

In the Green River, Vanicek (1967) reported that bonytail were generally found in pools and eddies in the absence of, although occasionally adjacent to, strong current and at varying depths generally over silt and silt-boulder substrates. Adult bonytail captured in Cataract, Desolation, and Gray Canyons were sympatric with humpback chub in shoreline eddies among emergent boulders and cobble, and adjacent to swift current (Valdez 1990). The diet of the bonytail is presumed similar to that of the humpback chub (USFWS 2002).

The only known bonytail that presently occur in the Yampa River are the individuals recently reintroduced at Echo Park, near the confluence with the Green River. In July of 2000 approximately 5,000 juveniles (5 to 10 cm) were stocked. Between 1998 and 2003, the number of bonytail stocked in the Green River subbasin was 189,438 fish, with majority of the fish being juveniles at the time of stocking.

Critical habitat for bonytail includes canyon reaches of the Green River (Whirlpool, Split Mountain, Desolation, and Gray Canyons), which have been affected by stream flow regulation. However, Whirlpool and Desolation Canyons have recently been invaded by high numbers of smallmouth bass changing the biological environment of critical habitat.

Although sufficient information on physical processes that affect bonytail habitats was not available to recommend specific flow and temperature regimes in the Green River to benefit this species, Muth et al. (2000) concluded that flow and temperature recommendations made for Colorado pikeminnow, razorback sucker, and humpback chub would presumably benefit bonytail and would not limit their future recovery potential.

Factors Affecting Species Environment within the Action Area

The primary threats to bonytail are stream flow regulation and habitat modification (affecting constituent elements: water and physical habitat); competition with and predation by nonnative fishes; hybridization with other native *Gila* species; and pesticides and pollutants (USFWS 2002) (affecting constituent element: biological environment). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. The threats to bonytail in relation to flow regulation and habitat modification, predation by nonnative fishes, and pesticides and pollutants are essentially the same threats identified for Colorado pikeminnow. Threats to bonytail in relation to hybridization are essentially the same threats identified for humpback chub.

Management actions identified in the recovery goals for bonytail (USFWS 2002) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations;
- provide passage over barriers within occupied habitat to allow unimpeded movement and, potentially, range expansion;
- investigate options for providing appropriate water temperatures in the Gunnison River;
- minimize entrainment of subadults and adults at diversion/out-take structures;
- investigate habitat requirements for all life stages and provide those habitats;
- ensure adequate protection from overutilization;
- ensure adequate protection from diseases and parasites;
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries;
- control problematic nonnative fishes as needed;
- minimize the risk of increased hybridization among *Gila* spp.;
- minimize the risk of hazardous-materials spills in critical habitat; and
- remediate water-quality problems.

Colorado pikeminnow (*Pytchocheilus lucius*)

Status of Species

Species / Critical Habitat Description

The Colorado pikeminnow is the largest cyprinid fish (minnow family) native to North America and evolved as the main predator in the Colorado River system. It is an elongated pike-like fish that during predevelopment times may have grown as large as 6 feet in length and weighed nearly 100 pounds (Behnke and Benson 1983). Today, Colorado pikeminnow rarely exceed 3 feet in length or weigh more than 18 pounds; such fish are estimated to be 45-55 years old (Osmundson et al. 1997). The mouth of this species is large and nearly horizontal with long slender pharyngeal teeth (located in the throat), adapted for grasping and holding prey. The diet of Colorado pikeminnow longer than 3 or 4 inches consists almost entirely of other fishes (Vanicek and Kramer 1969). Males become sexually mature earlier and at a smaller size than do females, though all are mature by about age 7 and 500 mm (20 inches) in length (Vanicek and Kramer 1969; Seethaler 1978; Hamman 1981). Adults are strongly countershaded with a dark, olive back, and a white belly. Young are silvery and usually have a dark, wedge-shaped spot at the base of the caudal fin.

Critical habitat was designated for Colorado pikeminnow on March 21, 1994 (59 FR 13374). Designated critical habitat makes up about 29% of the species' original range and occurs exclusively in the Upper Colorado River Basin. River reaches (including the 100-year floodplain) that make up critical habitat for Colorado pikeminnow within the VFO (59 FR 13374) include:

Utah, Uintah, Carbon, Grand, Emery, Wayne, and San Juan Counties; and Colorado, Moffat County. The Green River and its 100-year floodplain from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal Meridian) to the confluence with the Colorado River in T. 30 S., R. 19 E., Section 7 (Salt Lake Meridian).

Colorado, Rio Blanco County; and Utah, Uintah County. The White River and its 100-year floodplain from Rio Blanco Lake Dam in T. 1 N., R. 96 W., section 6 (6th Principal Meridian) to the confluence with the Green River in T. 9 S., R. 20 E., section 4 (Salt Lake Meridian).

The USFWS has identified water, physical habitat, and the biological environment as the primary constituent elements of critical habitat (59 FR 13374). Water includes a quantity of water of sufficient quality delivered to a specific location in accordance with a hydrologic regime required for the particular life stage for each species. The physical habitat includes areas of the Colorado River system that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. In addition, oxbows, backwaters, and other areas in the 100-year floodplain, when inundated, provide access to spawning, nursery, feeding, and rearing habitats. Food supply, predation, and competition are important elements of the biological environment.

Life History and Population Dynamics

The Colorado pikeminnow is a long-distance migrator; adults move hundreds of miles to and from spawning areas, and require long sections of river with unimpeded passage. Adults require pools, deep runs, and eddy habitats maintained by high spring flows. These high spring flows maintain channel and habitat diversity, flush sediments from spawning areas, rejuvenate food production, form gravel and cobble deposits used for spawning, and rejuvenate backwater nursery habitats. Spawning occurs after spring runoff at water temperatures typically between 18 and 23°C. After hatching and emerging from spawning substrate, larvae drift downstream to nursery backwaters that are restructured by high spring flows and maintained by relatively stable base flows. Flow recommendations have been developed that specifically consider flow-habitat relationships in habitats occupied by Colorado pikeminnow in the upper basin, and were designed to enhance habitat complexity and to restore and maintain ecological processes. The following is a description of observed habitat uses in the Upper Colorado River Basin.

Colorado pikeminnow live in warm-water reaches of the Colorado River mainstem and larger tributaries, and require uninterrupted stream passage for spawning migrations and dispersal of young. The species is adapted to a hydrologic cycle characterized by large spring peaks of snow-melt runoff and low, relatively stable base flows. High spring flows create and maintain in-channel habitats, and reconnect floodplain and riverine habitats, a phenomenon described as the spring flood-pulse (Junk et al. 1989; Johnson et al. 1995). Throughout most of the year, juvenile, subadult, and adult Colorado pikeminnow use relatively deep, low-velocity eddies, pools, and runs that occur in near shore areas of main river channels (Tyus and McAda 1984; Valdez and Masslich 1989; Tyus 1990, 1991; Osmundson et al. 1995). In spring, however, Colorado pikeminnow adults use floodplain habitats, flooded tributary mouths, flooded side canyons, and eddies that are available only during high flows (Tyus 1990, 1991; Osmundson et al. 1995). Such environments may be particularly beneficial for Colorado pikeminnow because other riverine fishes gather in floodplain habitats to exploit food and temperature resources, and may serve as prey. Such low-velocity environments also may serve as resting areas for Colorado pikeminnow. River reaches of high habitat complexity appear to be preferred.

Because of their mobility and environmental tolerances, adult Colorado pikeminnow are more widely distributed than other life stages. Distribution patterns of adults are stable during most of the year (Tyus 1990, 1991; Irving and Modde 2000), but distribution of adults changes in late spring and early summer, when most mature fish migrate to spawning areas (Tyus and McAda 1984; Tyus 1985, 1990, 1991; Irving and Modde 2000). High spring flows provide an important cue to prepare adults for migration and also ensure that conditions at spawning areas are suitable for reproduction once adults arrive. Specifically, bankfull or much larger floods mobilize coarse sediment to build or reshape cobble bars, and they create side channels that Colorado pikeminnow sometimes use for spawning (Harvey et al. 1993).

Colorado pikeminnow spawning sites in the Green River subbasin have been well documented. The two principal locations are in Yampa Canyon on the lower Yampa River and in Gray Canyon on the lower Green River (Tyus 1990, 1991). These reaches are 42 and 72 km long, respectively, but most spawning is believed to occur at one or two short segments within each of the two reaches. Another spawning area may occur in Desolation Canyon on the lower Green River (Irving and Modde 2000), but the location and importance of this area has not been

verified. Although direct observation of Colorado pikeminnow spawning was not possible because of high turbidity, radiotelemetry indicated spawning occurred over cobble-bottomed riffles (Tyus 1990). High spring flows and subsequent post-peak summer flows are important for construction and maintenance of spawning substrates (Harvey et al. 1993). In contrast with the Green River subbasin, where known spawning sites are in canyon-bound reaches, currently suspected spawning sites in the upper Colorado River subbasin are at six locations in meandering, alluvial reaches (McAda 2000).

After hatching and emerging from the spawning substrate, Colorado pikeminnow larvae drift downstream to backwaters in sandy, alluvial regions, where they remain through most of their first year of life (Holden 1977; Tyus and Haines 1991; Muth and Snyder 1995). Backwaters and the physical factors that create them are vital to successful recruitment of early life stages of Colorado pikeminnow, and age-0 Colorado pikeminnow in backwaters have received much research attention (e.g., Tyus and Karp 1989; Haines and Tyus 1990; Tyus 1991; Tyus and Haines 1991; Bestgen et al. 1997). It is important to note that these backwaters are formed after cessation of spring runoff within the active channel and are not floodplain features. Colorado pikeminnow larvae occupy these in-channel backwaters soon after hatching. They tend to occur in backwaters that are large, warm, deep (average, about 0.3 m in the Green River), and turbid (Tyus and Haines 1991). Recent research (Day et al. 1999a, 1999b; Trammell and Chart 1999) has confirmed these preferences and suggested that a particular type of backwater is preferred by Colorado pikeminnow larvae and juveniles. Such backwaters are created when a secondary channel is cut off at the upper end, but remains connected to the river at the downstream end. These chute channels are deep and may persist even when discharge levels change dramatically. An optimal river-reach environment for growth and survival of early life stages of Colorado pikeminnow has warm, relatively stable backwaters, warm river channels, and abundant food (Muth et al. 2000).

Status and Distribution

Based on early fish collection records, archaeological finds, and other observations, the Colorado pikeminnow was once found throughout warm water reaches of the entire Colorado River Basin down to the Gulf of California, and including reaches of the upper Colorado River and its major tributaries, the Green River and its major tributaries, and the Gila River system in Arizona (Seethaler 1978). Colorado pikeminnow apparently were never found in colder, headwater areas. The species was abundant in suitable habitat throughout the entire Colorado River Basin prior to the 1850s (Seethaler 1978). By the 1970s they were extirpated from the entire lower basin (downstream of Glen Canyon Dam) and portions of the upper basin as a result of major alterations to the riverine environment. Having lost some 75 to 80 percent of its former range due to habitat loss, the Colorado pikeminnow was federally listed as an endangered species in 1967 (Miller 1961, Moyle 1976, Tyus 1991, Osmundson and Burnham 1998). Full protection under the Act of 1973 occurred on January 4, 1974.

Colorado pikeminnow are presently restricted to the Upper Colorado River Basin and inhabit warm water reaches of the Colorado, Green, and San Juan rivers and associated tributaries (Figure 5). The Colorado pikeminnow recovery goals (USFWS 2002a) identify occupied habitat of wild Colorado pikeminnow as follows: the Green River from Lodore Canyon to the confluence of the Colorado River; the Yampa River downstream of Craig, Colorado; the Little

Snake River from its confluence with the Yampa River upstream into Wyoming; the White River downstream of Taylor Draw Dam; the lower 89 miles of the Price River; the lower Duchesne River; the upper Colorado River from Palisade, Colorado, to Lake Powell; the lower 34 miles of the Gunnison River; the lower mile of the Dolores River; and 150 miles of the San Juan River downstream from Shiprock, New Mexico, to Lake Powell. Colorado pikeminnow have been stocked in recent years, changes to the stocking plan are awaiting population estimates. In recent years the pikeminnow has been increasing the Colorado river but decreasing in the Green river (Thomas Czapla, personal communication).

Environmental Baseline

Status of the Species within the Action Area

Preliminary population estimates presented in the Recovery Goals (USFWS 2002a) for the three Colorado pikeminnow populations (Green River Subbasin, Upper Colorado River Subbasin, San Juan River Subbasin) ranged from 6,600 to 8,900 wild adults. These numbers provided a general indication of the total wild adult population size at the time the Recovery Goals were developed, however, it was also recognized that the accuracy of the estimates vary among populations.

Monitoring of Colorado pikeminnow populations is ongoing and sampling protocols and the reliability of the population estimates are being assessed by the USFWS and cooperating entities. A recent draft report on the status of Colorado pikeminnow in the Green River subbasin (Bestgen et al. 2004) presented population estimates for adult (>450 mm total length (TL)) and recruit-sized (400–449 mm TL) Colorado pikeminnow. The report suggests that over the study period (2001 to 2003) there was a decline in abundance of Colorado pikeminnow in the entire Green River basin from 3,304 (95 percent confidence interval, 2,900 to 3,707) fish in 2001 to 2,142 (95 percent confidence interval 1,686 to 2,598) fish in 2003, a 35% reduction. Bestgen et al. (2004) divided the Green River Basin into five main reaches: the Yampa River, the White rivers, and three reaches of the Green River. Three of these reaches are at least partially contained within the VFO: the White River, the middle Green River, and the Desolation-Gray Canyon reach of the Green River. Adult abundance estimates in the White River declined from 1,100 animals in 2000 to 407 animals in 2003 and recruit-sized estimates declined from 45 animals in 2001 to zero in 2003. In the middle Green River (Yampa River confluence to Desolation Canyon) abundance estimates for adults ranged from 1,613 animals in 2000 to 663 animals in 2003 and estimates of abundance of recruit-sized fish ranged from 103 animals in 2000 to 43 animals in 2003. Estimates for the Desolation-Gray Canyon reach of the Green River ranged from 699 adults in 2001 to 621 adults in 2003 and recruit-sized estimates ranged from 163 animals in 2001 to 152 animals in 2003. Studies indicate that significant recruitment of Colorado pikeminnow may not occur every year, but occurs in episodic intervals of several years (Osmundson and Burnham 1998).

All life stages of Colorado pikeminnow in the Green River demonstrate wide variations in abundance at seasonal, annual, or longer time scales, but reasons for shifts in abundance are poorly understood. Bestgen et al. (1998) captured drifting larvae produced from the two main spawning areas in the Green River system and found order-of-magnitude differences in abundance from year to year. They reported that low- or high-discharge years were often associated with poor reproduction but could not ascribe a specific cause-effect mechanism

(Bestgen et al. 1998). In general, similar numbers of age-0 fish were found in autumn in the middle Green River, in spite of different-sized cohorts of larvae produced each summer in the Yampa River. Conversely, numbers of Colorado pikeminnow larvae produced in the lower Green River were similar among years but resulted in variable age-0 fish abundance in autumn.

In the Green River subbasin, radio-telemetry studies have shown that distribution of adults changes in late spring and early summer when most mature fish migrate to spawning areas in the lower Yampa River in Yampa Canyon and the lower Green River in Gray Canyon (Tyus and McAda 1984; Tyus 1985; Tyus 1990; Tyus 1991; Irving and Modde 2000). Those fish remain in spawning areas for 3–8 weeks before returning to home ranges. Because adult Colorado pikeminnow converge on spawning areas from throughout the Green River system to reproduce at these two known localities, migration cues are an important part of the reproductive life history. In general, adults begin migrating in late spring or early summer. Migrations began earlier in low-flow years and later in high-flow years (Tyus and Karp 1989; Tyus 1990; Irving and Modde 2000). Migrations to the Yampa River spawning area occur coincident with, and up to 4 weeks after, peak spring runoff when water temperatures are usually 14–16 °C (Tyus 1990; Irving and Modde 2000). Rates of movement for individuals are not precisely known, but 2 individuals made the approximately 400 km migration from the White River below Taylor Draw Dam to the Yampa River spawning area in less than 2 weeks. Alteration of the natural hydrograph may alter the environmental cues triggering these spawning migrations.

High magnitude flows of infrequent occurrence are necessary to create and maintain spawning habitat. Infrequent intense flooding redistributes and creates spawning bars (O'Brien 1984). Annual lower-level flooding followed by recessional flows dissect and secondarily redistribute gravels, preparing them for spawning (Harvey et al. 1993). These studies conducted at a known spawning location in Yampa Canyon show that both processes are important for habitat maintenance and activities that reduce or re-time the annual peak or reduce the frequency of high magnitude flows are likely to reduce essential spawning habitat in amount and quality.

Similar to adults, distribution of early life stages of Colorado pikeminnow is dynamic on a seasonal basis and linked to habitat in the mainstem Green River downstream of spawning areas. After hatching and emergence from spawning substrate, larvae are dispersed downstream. A larva may drift for only a few days, but larvae occur in main channels of the Yampa and Green rivers for 3–8 weeks depending on length of the annual reproductive period (Nesler et al. 1988; Tyus and Haines 1991; Bestgen et al. 1998). The Yampa River spawning area consistently produces more larvae than the spawning area in the lower Green River (Bestgen et al. 1998).

Only one primary reach of Colorado pikeminnow nursery habitat is present in the Green River system within the VFO; from near Jensen, Utah, downstream to the Duchesne River confluence (Tyus and Haines 1991; McAda et al. 1994a; McAda et al. 1994; McAda et al. 1997). Larvae from the lower Yampa River are thought to mostly colonize backwaters in alluvial valley reaches between Jensen, Utah, and the Ouray National Wildlife Refuge. Most floodplain habitat along the current-day Green River is concentrated in this reach. Although the density of age-0 fish in autumn was usually higher in the lower than in the middle Green River (Tyus and Haines 1991; McAda et al. 1994a), differences in habitat quantity may have confounded abundance estimates. The reach of the Green River defined mostly by Desolation and Gray Canyons also provides

nursery habitat for Colorado pikeminnow (Tyus and Haines 1991; Day et al. 1999b). These backwaters are especially important during the Colorado pikeminnow's critical first year of life.

Backwaters and physical factors that create them are vital to successful recruitment of early life stages of Colorado pikeminnow. Occasional very high spring flows are needed to transport sediment and maintain or increase channel complexity. Sediment transport from the Little Snake River provides an estimated 60 percent of the total sediment supply to the Green River and is important to maintain equilibrium channel morphology and ensure continued creation and maintenance of backwater nursery habitats for Colorado pikeminnow and humpback chub (Hawkins and O'Brien 2001). During high-discharge events, the elevation of sand bars increases and if high flows persist through summer, few backwaters are formed (Tyus and Haines 1991). Post-runoff low flows sculpt and erode sand bars and create complex backwater habitat critical for early life stages of all native fishes, particularly Colorado pikeminnow. Deeper, chute-channel backwaters are preferred by age-0 Colorado pikeminnow in the Green River (Tyus and Haines 1991; Day and Crosby 1997; Day et al. 1999a; Trammell and Chart 1999). Alterations to the amount and timing of flows defining the natural hydrology and sediment transport processes may inhibit the processes that create and maintain these habitats.

Past research indicated that certain discharge levels may optimize backwater habitat availability below Jensen for age-0 Colorado pikeminnow (Pucherelli et al. 1990; Tyus and Haines 1991; Tyus and Karp 1991). However, many geomorphic processes are dynamic over time and driven by the level of spring flows, the frequency of large floods, and post-peak discharge levels (Bell et al. 1998; Rakowski and Schmidt 1999). Consequently, flows to achieve optimum backwater availability may be different each year and dependent upon year-to-year bar topography (Rakowski and Schmidt 1999).

Within the action area, Critical Habitat for Colorado pikeminnow is located along the Green River and its 100-year floodplain from the confluence with the Yampa River to the southern boundary of the VFO, and the White River and its 100-year floodplain from the Utah-Colorado border to the confluence with the Green River. As was discussed above, all primary constituent elements (water, physical habitat, and biological environment) have been affected throughout designated critical habitat on the Green River and in other occupied areas and could be further influenced through implementation of the proposed action. To date, water quantity and quality has been affected by flow regulation and land management practices (water depletion), which has resulted in increased concentrations of contaminants (most notably selenium). Physical habitat (spring adult staging areas (floodplain), spawning and nursery habitats) has been affected through flow regulation, land management practices (diking), and encroachment of nonnative vegetation (primarily tamarisk). The biological environment has been altered primarily due to the introduction of numerous species of nonnative fish disrupting the natural balance of competition and predation. All constituent elements of designated Colorado pikeminnow critical habitat along the Green and White Rivers will be considered in our analysis of the effects of the proposed action.

Factors Affecting Species Environment within the Action Area

The primary threats to Colorado pikeminnow are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; and pesticides and pollutants

(USFWS 2002a). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. These impairments are described in further detail below.

Stream flow regulation includes mainstem dams that cause the following adverse effects to Colorado pikeminnow and its habitat:

- block migration corridors,
- changes in flow patterns, reduced peak flows and increased base flows,
- release cold water, making temperature regimes less than optimal,
- change river habitat into lake habitat, and
- retain sediment that is important for forming and maintaining backwater habitats.

In the Upper Basin, 435 miles of Colorado pikeminnow habitat has been lost by reservoir inundation from Flaming Forge Reservoir. Cold water releases from dams eliminate suitable habitat for native fishes, including Colorado pikeminnow, from river reaches downstream for approximately 50 miles. In addition to main stem dams, many dams and water diversion structures occur in and upstream from critical habitat that reduce flows and alter flow patterns, which adversely affect critical habitat. Diversion structures in critical habitat divert fish into canals and pipes where the fish are permanently lost to the river system. It is unknown how many endangered fish are lost in irrigation systems, but in some years, in some river reaches, majority of the river flow is diverted into unscreened canals. High spring flows maintain habitat diversity, flush sediments from spawning habitat, increase invertebrate food production, form gravel and cobble deposits important for spawning, and maintain backwater nursery habitats (McAda 2000, Muth et al. 2000).

Predation and competition from nonnative fishes have been clearly implicated in the population reductions or elimination of native fishes in the Colorado River Basin (Dill 1944, Osmundson and Kaeding 1989, Behnke 1980, Joseph et al. 1977, Lanigan and Berry 1979, Minckley and Deacon 1968, Meffe 1985, Propst and Bestgen 1991, Rinne 1991). Data collected by Osmundson and Kaeding (1991) indicated that during low water years nonnative minnows capable of preying on or competing with larval endangered fishes greatly increased in numbers.

More than 50 nonnative fish species were intentionally introduced in the Colorado River Basin prior to 1980 for sportfishing, forage fish, biological control and ornamental purposes (Minckley 1982, Tyus et al. 1982, Carlson and Muth 1989). Nonnative fishes compete with native fishes in several ways. The capacity of a particular area to support aquatic life is limited by physical habitat conditions. Increasing the number of species in an area usually results in a smaller population of most species. The size of each species population is controlled by the ability of each life stage to compete for space and food resources and to avoid predation. Some life stages of nonnative fishes appear to have a greater ability to compete for space and food and to avoid predation in the existing altered habitat than do some life stages of native fishes. Tyus and Saunders (1996) cite numerous examples of both indirect and direct evidence of predation on razorback sucker eggs and larvae by nonnative species.

Threats from pesticides and pollutants include accidental spills of petroleum products and hazardous materials; discharge of pollutants from uranium mill tailings; and high selenium

concentration in the water and food chain (USFWS 2002a). Accidental spills of hazardous material into critical habitat can cause immediate mortality when lethal toxicity levels are exceeded. Pollutants from uranium mill tailings cause high levels of ammonia that exceed water quality standards. High selenium levels may adversely affect reproduction and recruitment (Hamilton and Wiedmeyer 1990, Stephens et al. 1992, Hamilton and Waddell 1994, Hamilton et al. 1996, Stephens and Waddell 1998, Osmundson et al. 2000).

Humpback chub (*Gila cypha*)

Status of Species

Species / Critical Habitat Description

The humpback chub is a medium-sized freshwater fish (less than 500 mm) of the minnow family. The adults have a pronounced dorsal hump, a narrow flattened head, a fleshy snout with an inferior-subterminal mouth, and small eyes. It has silvery sides with a brown or olive colored back.

The humpback chub is endemic to the Colorado River Basin and is part of a native fish fauna traced to the Miocene epoch in fossil records (Miller 1946; Minckley et al. 1986). Humpback chub remains have been dated to about 4000 B.C., but the fish was not described as a species until the 1940s (Miller 1946), presumably because of its restricted distribution in remote white water canyons (USFWS 1990). Because of this, its original distribution is not known. The humpback chub was listed as endangered on March 11, 1967.

Until the 1950s, the humpback chub was known only from Grand Canyon. During surveys in the 1950s and 1960s humpback chub were found in the upper Green River including specimens from Echo Park, Island Park, and Swallow Canyon (Smith 1960, Vanicek et al. 1970). Individuals were also reported from the lower Yampa River (Holden and Stalnaker 1975b), the White River in Utah (Sigler and Miller 1963), Desolation Canyon of the Green River (Holden and Stalnaker 1970) and the Colorado River near Moab (Sigler and Miller 1963).

Critical habitat was designated for humpback chub on March 21, 1994 (59 FR 13374). Designated critical habitat makes up about 28% of the species' original range and occurs in both the Upper and Lower Colorado River Basins. Although humpback chub life history and habitat use differs greatly from the other endangered Colorado River fish, the USFWS determined that the primary constituent elements (water, physical habitat, and biological environment) of their critical habitat were the same.

Critical habitat for humpback chub in the Green River system include the Yampa River within Dinosaur National Monument; Green River from its confluence with the Yampa River downstream to the southern boundary of Dinosaur National Monument, and the Green River within Desolation and Gray Canyons. Within the VFO, critical habitat has been designated in the following sections of the Colorado River Upper Basin (59 FR 13374).

Utah, Uintah County; and Colorado, Moffat County. The Green River from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal

Meridian) to the southern boundary of Dinosaur National Monument in T. 6 N., R. 24 E., section 30 (Salt Lake Meridian).

Utah, Uintah and Grand Counties. The Green River (Desolation and Gray Canyons) from Sumner's Amphitheater in T. 12 S., R. 18 E., section 5 (Salt Lake Meridian) to Swasey's Rapid (river mile 12) in T. 20 S., R. 16 E., section 3 (Salt Lake Meridian).

Life History and Population Dynamics

Unlike Colorado pikeminnow and razorback sucker, which are known to make extended migrations of up to several hundred miles to spawning areas, humpback chubs do not appear to make extensive migrations (Karp and Tyus 1990). Generally, humpback chub show fidelity for canyon reaches and move very little (Miller et al. 1982; Archer et al. 1985; Burdick and Kaeding 1985, Kaeding et al. 1990). Humpback chubs in Black Rocks (Valdez and Clemmer 1982), Westwater Canyon (Chart and Lentsch 1999a), and Desolation and Gray Canyons (Chart and Lentsch 1999b) do not migrate to spawn and movements of adult humpback chub in Black Rocks on the Colorado River were essentially restricted to a 1-mile reach. These results were based on the recapture of Carlin-tagged fish and radiotelemetry studies conducted from 1979 to 1981 (Valdez et al. 1982) and 1983 to 1985 (Archer et al. 1985, USFWS 1986, Kaeding et al. 1990).

In the Green River and upper Colorado River, humpback chubs spawned in spring and summer as flows declined shortly after the spring peak (Valdez and Clemmer 1982, Valdez et al. 1982, Kaeding and Zimmerman 1983, Tyus and Karp 1989, Karp and Tyus 1990, Chart and Lentsch 1999a and 1999b). Similar spawning periods were reported from Grand Canyon (Kaeding and Zimmerman 1983; Valdez and Ryel 1995, 1997). Although humpback chub are believed to broadcast eggs over mid-channel cobble and gravel bars, spawning in the wild has not been observed for this species. Gorman and Stone (1999) reported that ripe male humpback chubs in the Little Colorado River (LCR) aggregated in areas of complex habitat structure (i.e., matrix of large boulders and travertine masses combined with chutes, runs, and eddies, 0.5–2.0 m deep) and were associated with deposits of clean gravel.

Chart and Lentsch (1999b) estimated hatching dates for young *Gila* collected from Desolation and Gray Canyons between 1992 and 1995. They determined that hatching occurred on the descending limb of the hydrograph as early as 9 June 1992 at a flow of 139 m³/s and as late as 1 July 1995 at a flow of 731 m³/s. Instantaneous daily river temperatures on hatching dates over all years ranged from 20 to 22 °C.

Newly hatched larvae average 6.3–7.5 mm TL (Holden 1973, Suttikus and Clemmer 1977, Minckley 1973, Snyder 1981, Hamman 1982, Behnke and Benson 1983, Muth 1990), and 1-month-old fish are approximately 20 mm long (Hamman 1982). Unlike Colorado pikeminnow and razorback sucker, no evidence exists of long-distance larval drift (Miller and Hubert 1990, Robinson et al. 1998). Upon emergence from spawning gravels, humpback chub larvae remain in the vicinity of bottom surfaces (Marsh 1985) near spawning areas (Chart and Lentsch 1999a).

Backwaters, eddies, and runs have been reported as common capture locations for young-of-year humpback chub (Valdez and Clemmer 1982). These data indicate that in Black Rocks and Westwater Canyon, young utilize shallow areas. Habitat suitability index curves developed by

Valdez et al. (1990) indicate young-of-year prefer average depths of 2.1 feet with a maximum of 5.1 feet. Average velocities were reported at 0.2 feet per second.

Valdez et al. (1982), Wick et al. (1979), and Wick et al. (1981) found adult humpback chub in Black Rocks and Westwater Canyons in water averaging 50 feet in depth with a maximum depth of 92 feet. In these localities, humpback chub were associated with large boulders and steep cliffs.

Status and Distribution

Failure to recognize *Gila cypha* as a species until 1946 complicated interpretation of historic distribution of humpback chubs in the Green River (Douglas et al. 1989, 1998). Best available information indicates that before Flaming Gorge Dam, humpback chubs were distributed in canyon regions throughout much of the Green River, from the present site of Flaming Gorge Reservoir downstream through Desolation and Gray canyons (Vanicek 1967; Holden and Stalnaker 1975a; Holden 1991). In addition, the species occurred in the Yampa and White rivers. Pre-impoundment surveys of the Flaming Gorge Reservoir basin (Bosley 1960; Gaufin et al. 1960; McDonald and Dotson 1960; Smith 1960) reported both humpback chubs and bonytails from the Green River near Hideout Canyon, now inundated by Flaming Gorge Reservoir.

Historic collection records of humpback chub exist from the Yampa and White rivers, both tributaries to the Green River. Tyus (1998) verified the presence of seven humpback chubs in collections of the University of Colorado Museum, collected from the Yampa River in Castle Park between 19 June and 11 July 1948. A single humpback chub was found in the White River near Bonanza, Utah, in June 1981 (Miller et al. 1982b), and a possible bonytail-humpback chub intergrade was also captured in July 1978 (Lanigan and Berry 1981).

Present concentrations of humpback chub in the Upper Basin occur in canyon-bound river reaches ranging in length from 3.7 km (Black Rocks) to 40.5 km (Desolation and Gray Canyons). Humpback chubs are distributed throughout most of Black Rocks and Westwater Canyons (12.9 km), and in or near whitewater reaches of Cataract Canyon (20.9 km), Desolation and Gray Canyons (65.2 km), and Yampa Canyon (44.3 km), with populations in the separate canyon reaches ranging from 400 to 5,000 adults (see population dynamics). The Utah Division of Wildlife Resources has monitored the fish community in Desolation and Gray Canyons since 1989 and has consistently reported captures of age-0, juvenile, and adult *Gila*, including humpback chub, indicating a reproducing population (Chart and Lentsch 1999b). Distribution of humpback chubs within Whirlpool and Split Mountain Canyons is not presently known, but it is believed that numbers of humpback chub in these sections of the Green River are low.

The Yampa River is the only tributary to the Green River presently known to support a reproducing humpback chub population. Between 1986 and 1989, Karp and Tyus (1990) collected 130 humpback chubs from Yampa Canyon and indicated that a small but reproducing population was present. Continuing captures of juveniles and adults within Dinosaur National Monument indicate that a population persists in Yampa Canyon (T. Modde, USFWS, personal communication). Small numbers of humpback chub also have been reported in Cross Mountain Canyon on the Yampa River and in the Little Snake River about 10 km upstream of its confluence with the Yampa River (Wick et al. 1981; Hawkins et al. 1996).

Environmental Baseline

Status of the Species within the Action Area

Monitoring humpback chub populations is ongoing and sampling protocols and reliability of population estimates are being assessed by the USFWS and cooperating entities. The humpback chub recovery goals (USFWS 2002) provided the following preliminary population estimates for adults in the six populations:

Black Rocks, Colorado River, Colorado -- 900–1,500
Westwater Canyon, Colorado River, Utah -- 2,000–5,000
Yampa Canyon, Yampa River, Colorado -- 400–600
Desolation/Gray Canyons, Green River, Utah -- 1,500
Cataract Canyon, Colorado River, Utah -- 500
Grand Canyon, Colorado River and Little Colorado River, Arizona -- 2,000–4,700

Low numbers of humpback chub have been captured in Whirlpool Canyon and Split Mountain Canyon on the Green River in Dinosaur National Monument; however, these fish were considered part of the Yampa River population in the Recovery Goals (USFWS 2002), and not separate populations.

Tyus and Karp (1991) found that in the Yampa and Green rivers in Dinosaur National Monument, humpback chubs spawn during spring and early summer following peak flows at water temperatures of about 20°C. They estimated that the spawning period for humpback chub ranges from May into July, with spawning occurring earlier in low-flow years and later in high-flow years; spawning was thought to occur only during a 4–5 week period (Karp and Tyus 1990). Similar to the Yampa and Green rivers, peak hatch of *Gila* larvae in Westwater Canyon on the Colorado River appears to occur on the descending limb of the hydrograph following spring runoff at maximum daily water temperatures of approximately 20 to 21°C (Chart and Lentsch 1999a). Tyus and Karp (1989) reported that humpback chubs occupy and spawn in and near shoreline eddy habitats and that spring peak flows were important for reproductive success because availability of these habitats is greatest during spring runoff.

High spring flows that simulate the magnitude and timing of the natural hydrograph provide a number of benefits to humpback chubs in the Yampa and Green rivers. Bankfull and overbank flows provide allochthonous energy input to the system in the form of terrestrial organic matter and insects that are utilized as food. High spring flows clean spawning substrates of fine sediment and provide physical cues for spawning. High flows also form large recirculating eddies used by adult fish. High spring flows (exceeding 50 percent or greater) have been implicated in limiting the abundance and reproduction of some nonnative fish species under certain conditions (Chart and Lentsch 1999a, 1999b) and have been correlated with increased recruitment of humpback chubs (Chart and Lentsch 1999b).

Critical habitat for humpback chub includes canyon reaches of the Green River (Whirlpool, Split Mountain, Desolation, and Gray Canyons), which have been affected by stream flow regulation. However, Whirlpool and Desolation Canyons have recently been invaded by high numbers of smallmouth bass changing the biological environment of critical habitat.

Factors Affecting Species Environment within the Action Area

Although historic data are limited, the apparent range-wide decline in humpback chubs is likely due to a combination of factors including alteration of river habitats by reservoir inundation, changes in stream discharge and temperature, competition with and predation by introduced fish species, and other factors such as changes in food resources resulting from stream alterations (USFWS 1990).

The primary threats to humpback chub are stream flow regulation and habitat modification (affecting constituent elements: water and physical habitat); competition with and predation by nonnative fishes; parasitism; hybridization with other native *Gila* species; and pesticides and pollutants (USFWS 2002) (all affecting constituent element: biological environment). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. The threats to humpback chub in relation to flow regulation and habitat modification, predation by nonnative fishes, and pesticides and pollutants are essentially the same threats identified for Colorado pikeminnow.

Hybridization with roundtail chub (*Gila robusta*) and bonytail, where they occur with humpback chub, is recognized as a threat to humpback chub. A larger proportion of roundtail chub have been found in Black Rocks and Westwater Canyon during low flow years (Kaeding et al. 1990; Chart and Lentsch 2000), which increase the chances for hybridization.

Management actions identified in the recovery goals for humpback chub (USFWS 2002) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations,
- investigate the role of the mainstem Colorado River in maintaining the Grand Canyon population,
- investigate the anticipated effects of and options for providing warmer water temperatures in the mainstem Colorado River through Grand Canyon,
- ensure adequate protection from overutilization,
- ensure adequate protection from diseases and parasites,
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries,
- control problematic nonnative fishes as needed,
- minimize the risk of increased hybridization among *Gila* spp, and
- minimize the risk of hazardous-materials spills in critical habitat.

Razorback sucker (*Xyrauchen texanus*)

Status of Species

Species / Critical Habitat Description

Like all suckers (family Catostomidae, meaning “down mouth”), the razorback sucker has a ventral mouth with thick lips covered with papillae and no scales on its head. In general, suckers are bottom browsers, sucking up or scraping off small invertebrates, algae, and organic matter with their fleshy, protrusible lips (Moyle 1976). The razorback sucker is the only sucker with an abrupt sharp-edged dorsal keel behind its head. The keel becomes more massive with age. The head and keel are dark, the back is olive-colored, the sides are brownish or reddish, and the abdomen is yellowish white (Sublette et al. 1990). Adults often exceed 3 kg (6 pounds) in weight and 600 mm (2 feet) in length. Like Colorado pikeminnow, razorback suckers are long-lived, living 40-plus years.

Critical habitat was designated for razorback sucker on March 21, 1994 (59 FR 13374). Designated critical habitat makes up about 49% of the species’ original range and occurs in both the Upper and Lower Colorado River Basins (USFWS 1994). The primary constituent elements are the same as those described for Colorado pikeminnow. River reaches (including the 100-year floodplain) that make up critical habitat for Colorado razorback sucker within the VFO (59 FR 13374) include:

Utah, Uintah County; and Colorado, Moffat County. The Green River and its 100-year floodplain from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal Meridian) to Sand Wash in T. 11 S., R. 18 E., section 20 (6th Principal Meridian).

Utah, Uintah, Carbon, Grand, Emery, Wayne, and San Juan Counties. The Green River and its 100-year floodplain from Sand Wash at river mile 96 at T. 11 S., R. 18 E., section 20 (6th Principal Meridian) to the confluence with the Colorado River in T. 30 S., R. 19 E., Section 7 (6th Principal Meridian).

Utah, Uintah County. The White River and its 100-year floodplain from the boundary of the Uintah and Ouray Indian Reservation at river mile 18 in T. 9 S., R. 22 E., section 21 (Salt Lake Meridian) to the confluence with the Green River in T. 9 S., R. 20 E., section 4 (Salt Lake Meridian).

Utah, Uintah County. The Duchesne River and its 100-year floodplain from river mile 2.5 in T. 4 S., R. 3 E., section 30 (Salt Lake Meridian) to the confluence with the Green River in T. 5 S., R. 3 E., section 5 (Uintah Meridian).

The USFWS has identified water, physical habitat, and the biological environment as the primary constituent elements of critical habitat (59 FR 13374). Water includes a quantity of water of sufficient quality delivered to a specific location in accordance with a hydrologic regime required for the particular life stage for each species. The physical habitat includes areas of the Colorado River system that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. In addition, oxbows,

backwaters, and other areas in the 100-year floodplain, when inundated, provide access to spawning, nursery, feeding, and rearing habitats. Food supply, predation, and competition are important elements of the biological environment. The USFWS gave special consideration to habitats required for razorback sucker reproduction and recruitment when critical habitat was designated.

Life History and Population Dynamics

McAda and Wydoski (1980) and Tyus (1987) reported springtime aggregations of razorback suckers in off-channel habitats and tributaries; such aggregations are believed to be associated with reproductive activities. Tyus and Karp (1990) and Osmundson and Kaeding (1991) reported off-channel habitats to be much warmer than the mainstem river and that razorback suckers presumably moved to these areas for feeding, resting, sexual maturation, spawning, and other activities associated with their reproductive cycle. Prior to construction of large mainstem dams and the suppression of spring peak flows, low velocity, off-channel habitats (seasonally flooded bottomlands and shorelines) were commonly available throughout the Upper Basin (Tyus and Karp 1989, Osmundson and Kaeding 1991). Dams changed riverine ecosystems into lakes by impounding water, which eliminated these off-channel habitats in reservoirs. Reduction in spring peak flows eliminates or reduces the frequency of inundation of off-channel habitats. The absence of these seasonally flooded riverine habitats is believed to be a limiting factor in the successful recruitment of razorback suckers in their native environment (Tyus and Karp 1989, Osmundson and Kaeding 1991). Wydoski and Wick (1998) identified starvation of larval razorback suckers due to low zooplankton densities in the main channel and loss of floodplain habitats which provide adequate zooplankton densities for larval food as one of the most important factors limiting recruitment.

These fish can spawn as early as age 3 or 4, when they are 14 or more inches long. Depending on water temperature, spawning can take place as early as November or as late as June. In the upper Colorado River basin, razorbacks typically spawn between mid-April and mid-June. These fish reportedly migrate long distances to spawn, congregating in large numbers in spawning areas. While razorback suckers have never been directly observed spawning in turbid riverine environments within the Upper Basin, captures of ripe specimens (in spawning condition), both males and females, have been recorded (Valdez et al. 1982, McAda and Wydoski 1980, Tyus 1987, Osmundson and Kaeding 1989, Tyus and Karp 1989, Tyus and Karp 1990, Osmundson and Kaeding 1991, Platania 1990) in the Yampa, Green, Colorado, and San Juan rivers. Sexually mature razorback suckers are generally collected on the ascending limb of the hydrograph from mid-April through June and are associated with coarse gravel substrates (depending on the specific location).

Outside of the spawning season, adult razorback suckers occupy a variety of shoreline and main channel habitats including slow runs, shallow to deep pools, backwaters, eddies, and other relatively slow velocity areas associated with sand substrates (Tyus 1987, Tyus and Karp 1989, Osmundson and Kaeding 1989, Valdez and Masslich 1989, Osmundson and Kaeding 1991, Tyus and Karp 1990).

Habitat requirements of young and juvenile razorback suckers in the wild are not well known, particularly in native riverine environments. Prior to 1991, the last confirmed documentation of

a razorback sucker juvenile in the Upper Basin was a capture in the Colorado River near Moab, Utah (Taba et al. 1965). In 1991, two early juvenile (36.6 and 39.3 mm total length (TL)) razorback suckers were collected in the lower Green River near Hell Roaring Canyon (Gutermuth et al. 1994). Juvenile razorback suckers have been collected in recent years from Old Charley Wash, a wetland adjacent to the Green River (Modde 1996). Between 1992 and 1995 larval razorback suckers were collected in the middle and lower Green River and within the Colorado River inflow to Lake Powell (Muth 1995). In 2002, eight larval razorback suckers were collected in the Gunnison River (Osmundson 2002). No young razorback suckers have been collected in recent times in the Colorado River.

The razorback suckers are adapted to the widely fluctuating physical environment of the historical Colorado River. Adults can live 44-50 years and, once reaching maturity between two and seven years of age (Minckley 1983), apparently produce viable gametes even when quite old. Survival adaptations included the ability to spawn in a variety of habitats and flows regimes, and over a long season. In the event of several consecutive years with little or no recruitment (due to either too much or too little water), the demographics of the population as a whole might shift, but future reproduction would not be compromised. Average fecundity recorded in studies ranged from 100,800 to 46,740 eggs per female (Bestgen 1990). With varying age of maturity and the fecundity of the species, historically it would have been possible to quickly repopulate after a catastrophic loss of adults.

Status and Distribution

On March 14, 1989, the USFWS was petitioned to conduct a status review of the razorback sucker. Subsequently, the razorback sucker was designated as endangered under a final rule published on October 23, 1991 (56 FR 54957). The final rule stated "Little evidence of natural recruitment has been found in the past 30 years, and numbers of adult fish captured in the last 10 years demonstrate a downward trend relative to historic abundance. Significant changes have occurred in razorback sucker habitat through diversion and depletion of water, introduction of nonnative fishes, and construction and operation of dams" (56 FR 54957). Recruitment of razorback suckers to the population continues to be a problem.

Historically, razorback suckers were found in the mainstem Colorado River and major tributaries in Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and in Mexico (Ellis 1914, Minckley 1983). Bestgen (1990) reported that this species was once so numerous that it was commonly used as food by early settlers and, further, that commercially marketable quantities were caught in Arizona as recently as 1949. In the Upper Basin, razorback suckers were reported in the Green River to be very abundant near Green River, Utah, in the late 1800s (Jordan 1891). An account in Osmundson and Kaeding (1989) reported that residents living along the Colorado River near Clifton, Colorado, observed several thousand razorback suckers during spring runoff in the 1930s and early 1940s. In the San Juan River drainage, Platania and Young (1989) relayed historical accounts of razorback suckers ascending the Animas River to Durango, Colorado, around the turn of the century.

Currently, the largest concentration of razorback sucker remaining in the Colorado River Basin is in Lake Mohave on the border of Arizona and California. Estimates of the wild stock in Lake Mohave have fallen precipitously in recent years from 60,000 as late as 1991, to 25,000 in 1993

(Marsh 1993, Holden 1994), to about 9,000 in 2000 (USFWS 2002b). Until recently, efforts to introduce young razorback sucker into Lake Mohave have failed because of predation by non-native species (Minckley et al. 1991, Clarkson et al. 1993, Burke 1994). While limited numbers of razorback suckers persist in other locations in the Lower Colorado River, they are considered rare or incidental and may be continuing to decline.

In the Upper Colorado River Basin, above Glen Canyon Dam, razorback suckers are found in limited numbers in both lentic (lake-like) and riverine environments. The largest populations of razorback suckers in the upper basin are found in the upper Green and lower Yampa rivers (Tyus 1987). In the Colorado River, most razorback suckers occur in the Grand Valley area near Grand Junction, Colorado; however, they are increasingly rare. Osmundson and Kaeding (1991) reported that the number of razorback sucker captures in the Grand Junction area has declined dramatically since 1974. Between 1984 and 1990, intensive collecting effort captured only 12 individuals in the Grand Valley (Osmundson and Kaeding 1991). The wild razorback sucker population is considered extirpated from the Gunnison River (Burdick and Bonar 1997).

Razorback suckers are in imminent danger of extirpation in the wild. The virtual absence of any recruitment suggests a combination of biological, physical, and/or chemical factors that may be affecting the survival and recruitment of early life stages of razorback suckers. Within the Upper Basin, recovery efforts endorsed by the Recovery Program include the capture and removal of razorback suckers from all known locations for genetic analyses and development of discrete brood stocks. These measures have been undertaken to develop refugia populations of the razorback sucker from the same genetic parentage as their wild counterparts such that, if these fish are genetically unique by subbasin or individual population, then separate stocks will be available for future augmentation. Such augmentation may be a necessary step to prevent the extinction of razorback suckers in the Upper Basin. Razorback suckers will be stocked until at least 2010, current population estimates that stocking will likely continue after that date as well (Thomas Czapla, personal communication).

Environmental Baseline

Status of the Species within the Action Area

The largest concentration of razorback suckers in the Upper Basin exists in low-gradient flat-water reaches of the middle Green River between and including the lower few miles of the Duchesne River and the Yampa River (Tyus 1987; Tyus and Karp 1990; Muth 1995; Modde and Wick 1997; Muth et al. 2000). This area includes the greatest expanse of floodplain habitat in the Upper Colorado River Basin, between Pariette Draw at river mile (RM) 238 and the Escalante Ranch at RM 310 (Irving and Burdick 1995).

Lanigan and Tyus (1989) used a demographically closed model with capture-recapture data collected from 1980 to 1988 and estimated that the middle Green River population consisted of about 1,000 adults (mean, 948; 95 percent confidence interval, 758–1,138). Based on a demographically open model and capture-recapture data collected from 1980 to 1992, Modde et al. (1996) estimated the number of adults in the middle Green River population at about 500 fish (mean, 524; 95 percent confidence interval, 351–696). That population had a relatively constant length frequency distribution among years (most frequent modes were in the 505–515 mm-TL interval) and an estimated annual survival rate of 71 percent. The most recent estimate of wild

razorback sucker in the middle Green River was approximately 100, based on data collected in 1998 and 1999 (Bestgen et al. 2002). There are no current population estimates of razorback sucker in the Yampa River due to low numbers captured in recent years.

The lower Yampa River provides adult habitat, spawning habitat, and potential nursery areas occur downstream in the Green River (USFWS 1998a). Modde and Smith (1995) reported that adult razorback suckers were collected between RM 13 and RM 0.1 of the Yampa River. They also reported only one juvenile razorback sucker has been collected in the Yampa River. The single fish (389 mm) was collected at RM 39 in June 1994. The Green River from the confluence with the Yampa River to Sand Wash has the largest existing riverine population of razorback sucker (Lanigan and Tyus 1989; Modde et al. 1996). Razorback suckers are rarely found upstream as far as the confluence with the Little Snake River (McAda and Wydoski 1980; Lanigan and Tyus 1989). Tyus and Karp (1990) located concentrations of ripe razorback suckers at the mouth of the Yampa River during the spring in 1987-1989. Ripe fish were captured in runs associated with bars of cobble, gravel, and sand substrates in water averaging 0.63 m deep and mean velocity of 0.74 m/s.

Razorback suckers are permanent residents of the Green River below its confluence with the Yampa River and are reliant on in-channel habitat for spawning and flooded off-channel habitats for several aspects of their life history. In turn, these habitats are created and maintained by the natural hydrology and sediment transport provided by the Yampa River.

Spring migrations by adult razorback suckers were associated with spawning in historic accounts (Jordan 1891; Hubbs and Miller 1953; Sigler and Miller 1963; Vanicek 1967) and a variety of local and long-distance movements and habitat-use patterns have been subsequently documented. Spawning migrations (one-way movements of 30.4–106.0 km) observed by Tyus and Karp (1990) included movements between the Ouray and Jensen areas of the Green River and between the Jensen area and the lower Yampa River. Initial movement of adult razorback suckers to spawning sites was influenced primarily by increases in river discharge and secondarily by increases in water temperature (Tyus and Karp 1990; Modde and Wick 1997; Modde and Irving 1998). Flow and temperature cues may serve to effectively congregate razorback suckers at spawning sites, thus increasing reproductive efficiency and success. Reduction in spring peak flows may hinder the ability of razorback suckers to form spawning aggregations, because spawning cues are reduced (Modde and Irving 1998).

Captures of ripe fish and radio-telemetry of adults in spring and early summer were used to locate razorback sucker spawning areas in the middle Green River. McAda and Wydoski (1980) found a spawning aggregation of 14 ripe fish (2 females and 12 males) over a cobble bar at the mouth of the Yampa River during a 2-week period in early to mid-May 1975. These fish were collected from water about 1 m deep with a velocity of about 1 m/s and temperatures ranging from 7 to 16°C (mean 12°C). Tyus (1987) captured ripe razorback suckers in three reaches: 1) Island and Echo parks of the Green River in Dinosaur National Monument, including the lower mile of the Yampa River; 2) the Jensen area of the Green River from Ashley Creek (RM 299) to Split Mountain Canyon (RM 319); and 3) the Ouray area of the Green River, including the lower few miles of the Duchesne River. The Jensen area contributed 73 percent of the 60 ripe razorback suckers caught over coarse sand substrates or in the vicinity of gravel and cobble bars in those 3 reaches during spring 1981, 1984, and 1986.

Substantial numbers of razorback sucker adults have been found in flooded off-channel habitats in the vicinity of mid-channel spawning bars shortly before or after spawning. Tyus (1987) located concentrations of ripe fish associated with warm floodplain habitats and in shallow eddies near the mouths of tributary streams. Similarly, Holden and Crist (1981) reported capture of 56 adult razorback suckers in the Ashley Creek-Jensen area of the middle Green River from 1978 to 1980, and about 19 percent of all ripe or tuberculate razorback suckers collected during 1981–1989 ($N = 57$) were from flooded lowlands (e.g., Old Charlie Wash and Stewart Lake Drain) and tributary mouths (e.g., Duchesne River and Ashley Creek) (Tyus and Karp 1990). Radio-telemetry and capture-recapture data compiled by Modde and Wick (1997) and Modde and Irving (1998) demonstrated that most razorback sucker adults in the middle Green River moved into flooded environments (e.g., floodplain habitats and tributary mouths) soon after spawning. Tyus and Karp (1990, 1991) and Modde and Wick (1997) suggested that use of warmer, more productive flooded habitats by adult razorback suckers during the breeding season is related to temperature preferences (23–25°C; Bulkley and Pimental 1983) and abundance of appropriate foods (Jones and Sumner 1954; Vanicek 1967; Marsh 1987; Mabey and Shiozawa 1993; Wolz and Shiozawa 1995; Modde 1997; Wydoski and Wick 1998). Twelve ripe razorback suckers were caught in Old Charlie Wash during late May–early June 1986, presumably due to the abundant food in the wetland (Tyus and Karp 1991). Eight adult razorback suckers collected from Old Charlie Wash in late summer 1995 entered the wetland when it was connected to the river during peak spring flows (Modde 1996). Reduced spring flooding caused by lower regulated river discharges, channelization, and levee construction has restricted access to floodplain habitats used by adult razorback suckers for temperature conditioning, feeding, and resting (Tyus and Karp 1990; Modde 1997; Modde and Wick 1997; Wydoski and Wick 1998). The fact that these fish actively seek out this habitat suggests that the conditioning it provides them is important to their continued successful reproduction.

Razorback sucker larvae were collected each year in the Green River during 1992–1996. Over 99 percent ($N = 1,735$) of the larvae caught in the middle Green River during spring and early summer were from reaches including, and downstream of, the presumed spawning area near the Escalante Ranch (Muth et al. 1998). Based on the few larvae ($N = 6$) recorded from collections in the Echo Park reach in 1993, 1994, and 1996, reproduction by razorback suckers at the lower Yampa River spawning site appeared minimal, but sampling efforts in the two reaches immediately downstream of that site were comparatively low (Muth et al. 1998). Mean catch per unit effort (CPUE) was highly variable among years and river reaches but it is unclear whether this was a true measure of population abundance or was biased by differences in sampling efficiency (Muth et al. 1998). Numbers of razorback sucker larvae captured per year ranged from 20 in 1992 to 1,217 in 1994 for the middle Green River and from 5 in 1995 to 222 in 1996 for the lower Green River.

Collections in the lower Green River during 1993–1996 produced the first ever captures of razorback sucker larvae from this section of river. In the lower Labyrinth-upper Stillwater Canyon reach, 363 razorback suckers were caught; all from flooded side canyons, washes, backwaters, and side channels. Razorback sucker larvae were collected in the Echo Park area of the Green River in 1993, 1994, 1996, indicating successful spawning in the lower Yampa River (Muth et al. 1998).

Historically, floodplain habitats inundated and connected to the main channel by overbank flooding during spring-runoff discharges would have been available as nursery areas for young razorback suckers in the Green River. Tyus and Karp (1990) associated low recruitment with reductions in floodplain inundation since 1962 (closure of Flaming Gorge Dam), and Modde et al. (1996) associated years of high spring discharge and floodplain inundation in the middle Green River (1983, 1984, and 1986) with subsequent suspected recruitment of young adult razorback suckers. These floodplain habitats are essential for the survival and recruitment of larval fish. Relatively high zooplankton densities in these warm, productive habitats are necessary to provide adequate zooplankton densities for larval food. Loss or degradation of these productive floodplain habitats probably represents one of the most important factors limiting recruitment in this species (Wydoski and Wick 1998). The importance of these habitats is further underscored by the relationship between larval growth and mortality due to non-native predators (Bestgen et al. 1997). Predation by adult red shiners on larvae of native catostomids in flooded and backwater habitats of the Yampa, Green, or Colorado Rivers was documented by Ruppert et al. (1993) and Muth and Wick (1997). Water depletions and changes in timing of flows may reduce the quantity and availability of floodplain habitat, thus reducing larval growth and recruitment.

Critical Habitat for razorback sucker is located throughout Reaches 2 and 3 of the action area. As was discussed above, all primary constituent elements (water, physical habitat, and biological environment) have been affected throughout designated critical habitat on the Green River and to a lesser extent in other occupied areas (Reach 1). Habitat in those areas could be further affected through implementation of the proposed action. To date, water quantity and quality has been affected by flow regulation and land management practices (irrigated agriculture), which has resulted in increased concentrations of contaminants (most notably selenium). Physical habitat (spring adult staging areas (floodplain), spawning and nursery habitats) has been affected through flow regulation, land management practices (diking), and encroachment of nonnative vegetation (primarily tamarisk). The biological environment has been altered primarily due to the introduction of numerous species of nonnative fish disrupting the natural balance of competition and predation. All constituent elements of designated razorback sucker critical habitat along the Green River will be considered in our analysis of the effects of the proposed action.

Factors Affecting Species Environment within the Action Area

A marked decline in populations of razorback suckers can be attributed to construction of dams and reservoirs, introduction of nonnative fishes, and removal of large quantities of water from the Colorado River system. Dams on the mainstem Colorado River and its major tributaries have segmented the river system, blocked migration routes, and changed river habitat into lake habitat. Dams also have drastically altered flows, temperatures, and channel geomorphology. These changes have modified habitats in many areas so that they are no longer suitable for breeding, feeding, or sheltering. Major changes in species composition have occurred due to the introduction of numerous nonnative fishes, many of which have thrived due to human-induced changes to the natural riverine system. These nonnative fishes prey upon and compete with razorback suckers.

The primary threats to razorback sucker critical habitat are stream flow regulation and habitat modification (affecting both the water and physical habitat constituent elements); competition with and predation by nonnative fishes; and pesticides and pollutants (USFWS 2002b) (affecting the biological environment). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. The threats to razorback sucker are essentially the same threats identified for Colorado pikeminnow.

Management actions identified in the recovery goals for razorback sucker (USFWS 2002b) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations;
- provide passage over barriers within occupied habitat to allow unimpeded movement and, potentially, range expansion;
- investigate options for providing appropriate water temperatures in the Gunnison River;
- minimize entrainment of subadults and adults in diversion/out-take structures;
- ensure adequate protection from overutilization;
- ensure adequate protection from diseases and parasites;
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries;
- control problematic nonnative fishes as needed;
- minimize the risk of hazardous-materials spills in critical habitat;
- remediate water-quality problems; and
- minimize the threat of hybridization with white sucker.

Effects of the Action

Cultural Resources Management

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for cultural resources commonly entail the use of hand tools, power tools, or heavy machinery.

Surface-disturbing actions under this program could result in soil erosion and removal of upland vegetation within watersheds containing listed fish species could result in increased erosion and sediment that degrade water quantity (reducing ground water discharge into the stream, river, or lake) and water quality (changes in water chemistry, such as pH and dissolved oxygen; temperature; sediment loads; and nutrient availability). These changes in water quantity or quality can directly or indirectly affect listed fish species. Cultural resource activities may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Increased erosion may degrade water quality and increase sediment in the water. This could increase water temperature, decrease food supply, increase turbidity, and deplete oxygen. This could alter a specific hydraulic water regime which is required by a particular life stage for each species. In doing so, there may be decreases in quantity and quality of breeding,

spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Paleontological Resources Management

This program includes surveys, inventories, excavation activities, surface material collection, and interpretive site development. Surveys may involve multiple people and vehicles and can last up to several weeks. Inventories for paleontological resources commonly entail the use of hand tools, power tools, or heavy machinery.

Surface-disturbing actions under this program could result in soil erosion and removal of upland vegetation within watersheds containing listed fish species could result in increased erosion and sediment that degrade water quantity (reducing ground water discharge into the stream, river, or lake) and water quality (changes in water chemistry, such as pH and dissolved oxygen; temperature; sediment loads; and nutrient availability). These changes in water quantity or quality can directly or indirectly affect listed fish species. Paleontological resource activities may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Increased erosion may degrade water quality and increase sediment in the water. This could increase water temperature, decrease food supply, increase turbidity, and deplete oxygen. This could alter a specific hydraulic water regime which is required by a particular life stage for each species. In doing so, there may be decreases in quantity and quality of breeding, spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Fire and Fuels Management

Objectives of fire management are to protect life, property, and resources values from wildfire and restore the natural role of fire in the ecosystem. Major activities associated with the BLM's fire management program include: wildfire suppression, wildland fire use, prescribed burning, non-fire fuels treatments (mechanical and chemical), and emergency stabilization and rehabilitation following wildfires. Fire suppression methods may involve: fireline construction, use of fire suppression agents and retardants, and water withdrawals.

Increased vegetation disturbance or vegetation removal to support fire suppression activities or fires (wildland or prescribed), fire retardant or chemical treatment to vegetation, soil disturbance, and water removal may adversely impact Colorado river fish. Associated impacts may include loss of vegetation cover, soil stability and forage base; and changes to water chemistry, water temperature, and nutrient levels, negatively affecting the primary constituent elements for Colorado river fish species. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Lands and Realty Management

Objectives of the lands and realty management program are to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and

public needs. Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting rights-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend up to 30 years, or even in perpetuity.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation disturbance, and surface disturbance in the drainages of Colorado River fish habitats. These activities may result in direct water channel disturbance, vegetation disturbance or removal, increased occurrence of invasive plant species, and soil disturbance. Lands and realty management decisions may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Direct stream disturbances may adversely change the water channel morphology, structure, and water quality. Vegetation disturbances or removal (including chemical treatment of vegetation), may adversely affect cover, soil stability, forage base, water chemistry, water temperature, and nutrient levels. Pollutants in the area may decrease water quality and adversely impact the forage base. Land exchanges or disposals may fragment the watersheds in the action area, increasing the previously mentioned impacts. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Livestock Grazing Management

The objective of livestock grazing management is to maintain or improve forage production and range condition as a sustainable resource base for livestock grazing on BLM land. Livestock management includes designating the kind and class of livestock, seasons of use, locations of use and the numbers of livestock that are permitted to use BLM lands.

Activities occurring under this program may increase equipment and vehicle use, vegetation disturbance, and surface disturbance in the drainages of Colorado River fish habitats. These activities may result in vegetation disturbance, removal, alteration; and soil disturbance. Vegetation alteration or removal may decrease: cover, soil stability, stream morphology, forage base, water chemistry, water temperature, and nutrient levels. Livestock management decisions may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Increased erosion associated with surface disturbance may degrade water quality and increase sediment in the water. This could increase water temperature, decrease food supply, increase turbidity, and deplete oxygen. This could alter a specific hydraulic water regime which is required by a particular life stage for each species. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Minerals and Energy Management

The planning area will be open to consideration for exploration, leasing, and development of leasable minerals (oil, gas, coal, tar sands, and geothermal), locatable (gold, gypsum, uranium) and salable minerals (sand, gravel, building stone). Although stipulations or conditions may be included in the terms of these mineral contracts, there are potential impacts associated with these various activities. Mineral exploration and extraction often results in surface disturbance from

road and facility construction, removal of topsoil and overburden, stock piling of these materials, and post-mining reclamation and recontouring.

Activities occurring under this program may increase human presence, equipment use, surface disturbance in Colorado River fish habitat. These actions may increase the occurrence of chemical leaks into drainages, vegetation disturbances or removal, soil disturbances, increased occurrence of invasive plant species, and pollutants in drainages of Colorado river fish habitat. Vegetation disturbances or vegetation removal (including chemical treatment of vegetation), and increased invasive plant species may adversely affect cover, soil stability, forage base, water chemistry, water temperature, and nutrient levels. Pollutants in the area may affect Colorado River fish by decreasing water quality and impacting the forage base. Lethal and sublethal impacts may result from chemical spills. There may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Recreation and Travel Management

The recreation program includes providing for and managing recreational access, developing and maintaining recreation areas, issuing special recreation permits, providing information to the public about recreational resources, and assessing effects of recreational use on the natural resources. Under this program, OHV use, camping, rafting, hiking, fishing, boating, swimming, and other activities are allowed in designated areas.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation disturbance, and surface disturbance in the drainages of Colorado River fish habitats. These activities may result in direct water channel disturbance, vegetation disturbance or removal, increased occurrence of invasive plant species, and soil disturbance. Direct stream disturbances may adversely change the water channel morphology, structure, and water quality. Vegetation disturbances or removal (including chemical treatment of vegetation), may adversely affect: cover, soil stability, forage base, water chemistry, water temperature, and nutrient levels. Pollutants in the area may decrease water quality and adversely impact the forage base. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Riparian and Wetland Resources

The objective of riparian area management is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits in order to provide watershed protection while still preserving quality riparian dependent aquatic and terrestrial species habitats and, as appropriate, allow for reasonable resource uses.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation disturbance, and surface disturbance in the drainages of Colorado River fish habitats. These activities may result in direct water channel disturbance, vegetation disturbance or removal, increased occurrence of invasive plant species, and soil disturbance. Direct stream disturbances may adversely change the water channel morphology, structure, and water quality. Vegetation disturbances or removal (including chemical treatment of vegetation), may adversely affect: cover, soil stability, forage base, water chemistry, water temperature, and nutrient levels.

Pollutants in the area may decrease water quality and adversely impact the forage base. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Soil and Water Resources

The objectives for the soil and water resources management program are to maintain and improve soil integrity, and long-term soil productivity through implementation of rangeland health standards and other soil protection measures, as well as to protect, maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards and to provide for availability of water to facilitate authorized uses.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation disturbance, and surface disturbance in the drainages of Colorado River fish habitats. These activities may result in direct water channel disturbance, vegetation disturbance or removal, increased occurrence of invasive plant species, and soil disturbance. Direct stream disturbances may adversely change the water channel morphology, structure, and water quality. Vegetation disturbances or removal (including chemical treatment of vegetation), may adversely affect: cover, soil stability, forage base, water chemistry, water temperature, and nutrient levels. Pollutants in the area may decrease water quality and adversely impact the forage base. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Vegetation Management

Program objectives are to maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources. Therefore, this program includes mechanical, chemical, biological, cultural vegetation management methodologies. These management methodologies may result in ground disturbing activities, chemical impacts, human disturbances, and impacts to vegetation from biological management techniques.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation treatment or disturbance (mechanical, chemical, biological), and surface disturbance in drainages of Colorado River fish habitats. These activities may result in vegetation disturbance or removal, adverse chemical treatment to vegetation, increased occurrence of invasive plant species, and soil disturbance. Vegetation disturbances, vegetation removal, chemical treatment of vegetation, or increased invasive plant species may adversely affect availability of riparian vegetation cover and water quality. In doing so, there may be decreases in quantity and quality of breeding, spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Wild Horse Management

The objective of wild horse management is the protection, management, and control of wild free-roaming horses on public lands. Because the proposed action calls for removal of horse populations, the main management activity under this program is herd gathering.

Surface-disturbing actions under this program could result in soil erosion and removal of upland vegetation within watersheds containing listed fish species could result in increased erosion and sediment that degrade water quantity (reducing ground water discharge into the stream, river, or lake) and water quality (changes in water chemistry, such as pH and dissolved oxygen; temperature; sediment loads; and nutrient availability). These changes in water quantity or quality can directly or indirectly affect listed fish species. Wild horse management activities may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Increased erosion may degrade water quality and increase sediment in the water. This could increase water temperature, decrease food supply, increase turbidity, and deplete oxygen. This could alter a specific hydraulic water regime which is required by a particular life stage for each species. In doing so, there may be decreases in quantity and quality of breeding, spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Wildlife and Fisheries Management

This program aims to maintain biological diversity, improve habitat for wildlife and fisheries, and provide habitats for threatened and endangered species.

Activities occurring under this program may increase equipment and vehicle use, vegetation treatment or disturbance, and surface disturbance in drainages of Colorado River fish habitats. In the short-term, vegetation disturbances or vegetation removal may adversely affect availability of riparian vegetation, thereby impacting the watershed stability, vegetation cover, forage base, and water quality. Long-term benefits may include: increased bank stability, availability of habitat, and forage base. As a result of short-term and long-term effects, Colorado River fishes may have increased reproductive success and increased survival at all life stages.

Woodlands and Forests Resources

The forest management program implements silvicultural practices including site preparation, regeneration, stand protection, stand maintenance, pre-commercial and commercial thinning for density management, fertilization, pruning, forest and woodland condition restoration treatments, and salvage harvest. The program allows the treatment of forest insect and disease infestations by spraying, cutting, and removal; and herbicidal spraying of grasses and shrubs. Forest management actions may also include conducting surveys, obtaining easements, pursuing legal access, allowing road development, and installing drain culverts and water bars. Wood and seed collection as well as non-commercial harvest of posts and Christmas trees are also authorized under this program.

Activities occurring under this program may increase human presence, equipment and vehicle use, vegetation treatment or disturbance, and surface disturbance in drainages of Colorado River

fish habitats. Associated impacts include: vegetation disturbance or removal, adverse chemical treatment to vegetation, increased occurrence of invasive plant species, and soil disturbance. Vegetation disturbances, vegetation removal, chemical treatment of vegetation, or increased invasive plant species may adversely affect availability of riparian vegetation cover and water quality. In doing so, there may be decreases in quantity and quality of breeding, spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Non-WSA Lands with Wilderness Characteristics

The objectives of this program are to manage lands with valuable wilderness characteristics in order to preserve those characteristics. These lands are generally lands that may be nominated in the future to become WSAs or congressionally delegated wilderness.

Surface-disturbing actions under this program could result in soil erosion and removal of upland vegetation within watersheds containing listed fish species could result in increased erosion and sediment that degrade water quantity (reducing ground water discharge into the stream, river, or lake) and water quality (changes in water chemistry, such as pH and dissolved oxygen; temperature; sediment loads; and nutrient availability). These changes in water quantity or quality can directly or indirectly affect listed fish species. Program management activities may negatively affect the primary constituent elements for the Colorado River fish species designated critical habitat. Increased erosion may degrade water quality and increase sediment in the water. This could increase water temperature, decrease food supply, increase turbidity, and deplete oxygen. This could alter a specific hydraulic water regime which is required by a particular life stage for each species. In doing so, there may be decreases in quantity and quality of breeding, spawning, and nursery habitats and degradation of foraging habitats. As a result, there may be decreases in reproductive success, and decreases in survival at all life stages (egg, larval, young of year, juvenile, and adult).

Water Depletions

Water depletions from the Upper Colorado River Basin are a major factor in the decline of the threatened and endangered Colorado River fish. The USFWS determined that any depletion will jeopardize their continued existence and will likely contribute to the destruction or adverse modification of their critical habitat (USDI, Fish and Wildlife Service, Region 6 Memorandum, dated July 8, 1997). However, the Recovery Program was established specifically to offset the negative effects of water depletions to the endangered fish populations, and to act as the Reasonable and Prudent Alternative for these depletions. Actual water depletions will be determined, and Section 7 consultation reinitiated on a project-specific basis.

Cumulative Effects for the Bonytail, Colorado Pikeminnow, Humpback Chub, and Razorback Sucker

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects to bonytail, Colorado pikeminnow, humpback chub, and razorback sucker under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Changes in land use patterns that would further fragment, modify, or destroy potential spawning sites or designated critical habitat.
- Shoreline recreational activities and encroachment of human development that would remove upland or riparian/wetland vegetation and potentially degrade water quality.
- Competition with, and predation by, exotic fish species introduced by anglers or other sources.
- Program management actions that would reduce the potential for catastrophic wildland fires, vegetation loss, and negative changes to water quality by some, or all, of the following groups, on lands adjoining or upstream of BLM-administered lands:
 - State of Utah
 - County Governments in Utah
 - Local Governments in Utah
 - Private landholders in Utah

Colorado river fishes occur throughout the Upper Colorado River Basin of the action area for the proposed RMP amendment. The watersheds affecting Colorado river fishes include a checkerboard pattern of land ownership including Federal, State, and private landowners. Colorado river fishes are susceptible to activities on State and private lands. Many of these activities, such as livestock grazing; research; construction and operation of dams along major waterways; water retention, diversion, or dewatering of springs, wetlands, or streams; oil and gas exploration and development; human population expansion and associated infrastructure (increased trails and roads); and recreation activities (e.g. off-road vehicles), are expected to continue on State and private lands within the Colorado river fishes' range. Contributing as cumulative effects to the proposed action, these activities will continue to affect Colorado river fishes' persistence with impacts to staging areas, spawning habitats, nursery habitats, and foraging habitat (including designated critical habitat), further degrading habitat, and increasing non-native fish populations.

Conclusion for the Bonytail, Colorado Pikeminnow, Humpback Chub, and Razorback Sucker

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the resource protection measures that were incorporated into the project design.

It is our opinion that the proposed action are not likely to jeopardize the continued existence of the Colorado River Fishes, and are not likely to jeopardize the continued existence of these species or adversely modify their habitat. We base our conclusion on the following:

1. Treatment sizes will be limited during any single year, both in space and time, in the species range. Vegetation removed during project related activities will not impact large portions of the Upper Colorado River Basin and, with conservation measures applied, are

not expected to significantly affect water quality or flows to impact the Colorado river fishes or their critical habitat.

2. In addition, the Recovery Programs for the endangered Colorado River fishes conduct intensive fish community monitoring throughout the potentially affected area. The USFWS is a participant on both programs and we believe that those monitoring programs, although not specifically designed to determine cause and affect relationships, will provide useful information to assess site-specific projects under the proposed action. The USFWS will rely heavily on the results of Recovery Program monitoring to determine if additional Section 7 consultation is required.
3. All site-specific projects designed under the proposed Resource Management Plan would be subject to consultation requirements under Section 7 of the Endangered Species Act.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3).

Actual take levels are unquantifiable because the VFO BLM Resource Management Plan implementation includes all possible projects authorized on all Vernal Field Office lands in Utah and may occur within threatened or endangered species' habitats. However, although unquantifiable, take may occur through harm and harassment. Therefore, in the event that the applicant committed Conservation Measures are not completely incorporated into project-specific design, or if site-specific characteristics may lead to effects not considered in this biological opinion, Section 7 consultation will be reinitiated at the project-specific level.

No exemption from Section 9 of the Act is granted in this biological opinion. BLM's implementation of Resource Management Plans is likely to adversely affect listed species. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, will be addressed in project-level consultations. Levels of incidental take and measures to reduce such take cannot be effectively identified at the level of proposed action because of the broad geographic scope and time frame, and the lack of site specific information. Rather, incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to Section 7 consultations at the project-specific scale.

REASONABLE AND PRUDENT MEASURES / TERMS AND CONDITIONS

BLM coordinated and developed, with the U.S. Fish and Wildlife Service, species-specific conservation measures. These conservation measures were included as part of the Resource Management Plan project description. Therefore, the USFWS believes that additional Reasonable and Prudent Measures and Terms and Conditions will not be necessary in this programmatic opinion due the BLM's proactive initiation to minimize impacts on listed species. We commend BLM's efforts to conserve and protect threatened and endangered species. It is possible that additional reasonable and prudent measures and terms and conditions may be required on a project-specific level, in a tiered consultation to this programmatic opinion.

RECOMMENDED CONSERVATION MEASURES

The U.S. Fish and Wildlife Service recommends incorporating the following guidance into the Resource Management Plan to ensure successful management, protection, and recovery of listed species and their habitats at the landscape and site-specific levels. The USFWS understands that Recommended Measures are not always feasible or applicable for all projects. Available Recovery Plans, Conservation Agreements/Strategies, Scientific Literature, and other available information should consistently be applied to occupied, suitable, and potentially suitable habitats of listed species. The following recommendations should be used in conjunction with available species-specific plans and literature and appropriately applied at the landscape and site-specific planning levels in a manner that ensures conservation and recovery of listed and sensitive species. In general, these guidelines should apply to listed and sensitive species habitats in areas of known and likely occurrence, particularly where recovery and conservation objectives have been identified by available species-specific plans.

All Species

- Avoid land trades/disposals of listed and sensitive species habitats.
- Avoid the broad-scale use of pesticides and insecticides in habitats of listed species, during sensitive time periods such as breeding and nesting seasons.
- Avoid use of pesticides in riparian habitats and areas adjacent to riparian areas. If used, avoid drift and apply non-persistent pesticides with low bioaccumulation potential.
- Encourage management that maintains sagebrush ecological sites.
- Avoid practices that permanently convert sagebrush shrubland to nonnative grassland.
- Implement management strategies that maintain or improve degraded riparian communities; protect natural flow requirements; protect water quality; manage for stable non-eroding banks; and manage for year-round flows.
- Manage riparian areas from a watershed perspective. Ensure that riparian areas within the project are as continuous as possible along the entire drainage and are as wide as the soil and water table will allow riparian vegetation to exist.

- Manage riparian areas to ensure a multi-aged, multi-layered structure, allowing for retention of snags and diseased trees. Provide multiple layers of vegetation (vertical structure) within 10 feet of the ground.
- Enhance the protection of wetland functions by emphasizing the protection of natural wetland structure, composition, and ecological processes.
- Establish appropriate buffers between wetlands and incompatible land uses adequate to preserve the functional integrity of the wetlands.
- Discourage development of natural water sources under BLM's management.
- When considering spring development/redevelopment, evaluate springs for occurrence of flora and fauna, with particular focus on detecting rare or unique species. Maintain sufficient water to sustain native flora and fauna. Return unused or overflow water to its original drainage. Protect the spring source area from detrimental impacts, e.g. from livestock, recreationists. Protect the spring source from risk of degradation of water quality.
- Fully mitigate all unavoidable habitat losses for listed and migratory birds, at a suggested ratio of 1:1. Mitigate all unavoidable riparian losses at a suggested ratio of 2:1. This ratio may be increased if mitigation does not occur prior to disturbance, if replacement habitat is less valuable than lost habitat, if habitat fragmentation is causing broad-scale impacts to remaining available habitats, or other reasons. Both direct and indirect habitat losses will be considered and fully mitigated.
- Include native forbs and grasses in seeding mixtures where feasible.
- Monitor condition of habitat in occupied, suitable, or potentially suitable habitat for listed and sensitive species to ensure maintenance of good to excellent ecological conditions; restoration and conservation of good to excellent aquatic habitat conditions; and consistent with available species-specific habitat requirements.
- Consider wildlife use when designing spring exclosures.
- If water developments occur, divert water several hundred feet downstream of the water source to allow wildlife to benefit, hydric species to perpetuate, and water quality to remain high.
- Limit the amount of time livestock spend in pastures with riparian areas; base grazing seasons/length on condition of riparian vegetation.
- Maintain or modify existing grazing regimes to promote growth of desirable vegetation and maintain desirable understory vegetation. Temporarily remove grazing from degraded habitats and habitats recovering from fire and other disturbances.
- Manage grazing to maintain riparian habitats with all desirable vegetation structure and age classes.
- Avoid construction or expansion of recreation facilities within occupied, suitable, and potentially suitable habitat for listed and sensitive species.

- Limit the number of new roadways in project areas when possible to protect wildlife and plant resources. Decommission unnecessary roads and reclaim unauthorized illegal trails in habitats important to listed and sensitive species.
- Where appropriate at designated recreation sites, design recreation activities that are predictable for wildlife; i.e. provide well-marked trails or boardwalks to encourage controlled and predictable human use away from listed and sensitive species habitats, and discourage off-trail hiking and creation of alternate routes.
- Avoid constructing new trails along or parallel to riparian areas.
- Reduce or restrict recreational uses including, but not limited to, all-terrain vehicles, bicycles, horses, birdwatchers, and hikers in riparian areas.
- Where recreation conflicts with use by listed and sensitive species, and area closures are not practical, provide on-site monitoring to educate users and control use.
- Sponsor programs and post signs that educate users about the value of riparian habitat to listed and sensitive species.
- Provide interpretive site and literature on recognition and value of protecting biological soil crusts at major access points in areas of extensive or unique crust formation.
- Avoid building new roads and trails in riparian areas, and avoid stream crossings.
- Close affected watersheds and/or riparian areas to livestock grazing for one or more years to allow for recovery of riparian vegetation. The appropriate length of time for closure to grazing will depend on site-specific characteristics.
- Avoid or restrict mineral development activities in riparian habitats.
- Disturbances of all suitable habitats for listed and sensitive species will be improved to provide adequate habitat (pre-disturbance condition or better).

Mexican spotted owl

- Consider seasonal (March 1 – August 31) and spatial (0.5 mile) closures for recreational activities within PAC areas and suitable owl habitats.
- Maintenance of existing facilities within occupied (including PACs) and suitable Mexican spotted owl habitats should be avoided during the breeding season (March 1 – August 31).
- Implement recreational restrictions that protect occupied (including PACs) and suitable Mexican spotted owl habitats. Include these restrictions as part of all special recreation permits. Examples include, but are not limited to group size limits, length of stay, allowed use areas.
- Avoid road or trail building within PACs.
- Assess the presence and intensity of recreational activities in PACs, and apply appropriate measures to minimize impacts to the Mexican spotted owl and its habitat, in accordance with Recovery Plan recommendation and best available scientific information.

- Limit OHV and Guided Vehicle Tour uses to designated road and trails in Mexican spotted owl habitat and PACs.
- Conduct pre- and post-monitoring of Mexican spotted owl habitat conditions in PAC areas for surface disturbing activities.

Plants

- Avoid use of aerosol insecticides within 3 miles of listed plant populations to protect pollinators.
- Direct recreational activities away from occupied habitats of listed and sensitive plant species.

Colorado Fish Species

- Implement INFISH standards or other appropriate methodologies based on soil and terrain conditions, to provide riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability.
- In accordance with INFISH, no disturbance should occur within a buffer zone of 300' on each side of perennial fish bearing streams, 150' on each side of perennial non-fish bearing streams, and between 50' - 100' on each side of intermittent streams.
- Encourage activities to eliminate competing nonnative species and discourage any introduction of nonnative species into aquatic systems.
- Allow for translocations, fish control and removal, transfers, and other movement of fish for conservation and recovery of the species.
- Implement management strategies to restore fish passage, restore and retain natural hydrograph and hydrology, restore and ensure an appropriate distribution of aquatic habitats with special attention to native aquatic species, and restore and protect natural stream processes and function.
- In watersheds that are adjacent to the Colorado, Green, and White Rivers (and their important tributaries), and within major seleniferous formations (e.g., Mancos Shale and Duchesne), manage biological soil crusts to reduce erosion of selenium-bearing soils to habitat for endangered Colorado River fish.
- Provide resource protection measures associated with fishing access, i.e. provide well-marked trails or boardwalks to encourage controlled and predictable human use and discourage off-trail hiking and creation of alternate routes particularly in riparian areas.
- Implement INFISH standards (i.e., riparian buffers), or other appropriate methodologies based on soil and terrain conditions, to provide riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability.
- Avoid construction of fire lines using mechanized equipment so that they cross stream channels or terminate at the stream channel.

- Avoid mixing or applying fire suppressant chemicals (i.e. surfactant foam or retardant formulations) within 300 feet of the stream channel, except when a threat to human life or property exists.
- Avoid transferring water from one watershed into another for the purpose of water drops, as this may aid in spread of water-borne diseases such as whirling disease.
- Manage fire regimens (prescribe and wild) to protect or improve riparian and flood plain habitats.
- Pipeline crossings of perennial, intermittent, and ephemeral stream channels should be constructed to withstand floods of extreme magnitude to prevent breakage and subsequent accidental contamination of runoff during high flow events.
- Surface crossings must be constructed high enough to remain above the highest possible stream flows at each crossing, and subsurface crossings must be buried deep enough to remain undisturbed by scour throughout passage of the peak flow.
- To avoid repeated maintenance of pipeline crossings, hydraulic analysis should be completed in the design phase to eliminate costly repair and potential environmental degradation associated with pipeline breaks at stream crossings

RE-INITIATION STATEMENT

This is a program-level document that does not include project specific detail for actions authorized by the Resource Management Plan. Additional consultation with USFWS will be necessary for any authorized project specific action that may impact any listed species

This concludes formal consultation on the Vernal BLM Field Office Resource Management Plan. As provided in 50 CFR §402.16, re-initiation of formal consultation is required if: 1) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, 3) a new species is listed or critical habitat designated that may be affected by the action, 4) a project proposing biological control measures is proposed or 5) water depletions are expected to occur.

Thank you for your interest in conserving threatened and endangered species. If we can be of further assistance, please contact Katherine Richardson at (801) 975-3330 ext. 125 or Laura Romin at ext. 123.

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APPENDIX A – BLM COMMITTED CONSERVATION MEASURES AND LEASE NOTICES

Committed Mitigation Identified in Chapter 2 of the EIS and Those Resulting From Consultation on Existing Land Use Plans

- In consultation with USFWS and UDWR, apply species-specific protective stipulations on federal actions to avoid or minimize adverse effects on federally listed, proposed, or candidate species or suitable habitat for the same species.
- Maintain adequate baseline information regarding the extent of special status species to make informed decisions, evaluate the effectiveness of management actions, and assess progress toward recovery. Implement species-specific conservation measures to avoid or mitigate adverse impacts on known populations and their habitats of BLM special status plant and animal species on BLM administered lands.
- In areas where multiple resources are potentially affected by surface disturbance (e.g., crucial-value wildlife habitat, livestock pastures, threatened and endangered and special status species habitat, and occupied wild horse and burro range), coordinate implementation of any offsite mitigation with other affected agencies and the overlapping resource values.
- Cooperate with the USFWS, other agencies, and universities to develop plans for federally listed plant and animal species.
- Work with the UDWR to identify and improve special status fish passage and habitat connectivity. Maintain or improve habitat for reintroduction of special status fish species to streams. Maintain special status plant species communities in natural patterns on a landscape scale.
- Follow guidelines and implement management recommendations presented in species recovery or conservation plans or alternative management strategies developed in consultation with USFWS.
- Prohibit surface disturbances that may affect listed species or critical habitat of plants or animals (T&E or Candidate) without consultation or conference (ESA Section 7) between the BLM and USFWS.
- Continue to work with USFWS and others to ensure that plans and agreements are updated to reflect the latest scientific data

Species Specific BLM Committed Conservation Measures

As part of the Proposed Plan, the BLM has included conservation measures to minimize or eliminate adverse impacts to federally listed species. These measures are listed by species and are extrapolated from the *Biological Opinion for the Existing Utah BLM RMP*, the *Amendment of Informal Oil & Gas Lease Sales Consultation (05-0215)* and the *Utah BLM RMP Biological Opinion (6-UT-07-F-0018) Conservation Measures*.

Ute Ladies'-Tresses

In order to minimize effects to the federally threatened Ute ladies'-tresses, the BLM in coordination with the USFWS, developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. Ute ladies'-tresses habitat is provided some protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Although plants, habitat, or populations may be afforded some protection under these regulatory mechanisms, the following conservation measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area, including areas where hydrology might be affected by project activities, within potential habitat⁴ prior to any ground disturbing activities to determine if suitable habitat is present.
2. Within suitable habitat, site inventories will be conducted to determine occupancy. Inventories:
 - a. Must be conducted by qualified individual(s) and according to BLM and USFWS accepted survey protocols;
 - b. Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance or areas that could experience direct or indirect changes in hydrology from project activities;
 - c. Will be conducted prior to initiation of project activities and within the same growing season, at a time when the plant can be detected, and during appropriate flowering periods (usually August 1st and August 31st in the Uinta Basin; however, surveyors should verify that the plant is flowering by contacting a BLM or USFWS botanist or demonstrating that the nearest known population is in flower);
 - d. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad;
 - e. Will include, but not be limited to, plant species lists, habitat characteristics, source of hydrology, and estimated hydroperiod; and
 - f. Will be valid until August 1st the following year.
3. Design project infrastructure to minimize direct or indirect impacts to suitable habitat both within and downstream of the project area:
 - a. Alteration and disturbance of hydrology will not be permitted;
 - b. Reduce well pad size to the minimum needed, without compromising safety;
 - c. Limit new access routes created by the project;

- d. Roads and utilities should share common right-of-ways where possible;
 - e. Reduce width of right-of-ways and minimize the depth of excavation needed for the road bed;
 - f. Construction and right-of-way management measures should avoid soil compaction that would impact Ute ladies'-tresses habitat;
 - g. Off-site impacts or indirect impacts should be avoided or minimized (i.e. install berms or catchment ditches to prevent spilled materials from reaching occupied or suitable habitat through either surface or groundwater);
 - h. Place signing to limit off-road travel in sensitive areas;
 - i. Stay on designated routes and other cleared/approved areas; and,
 - j. All disturbed areas will be re-vegetated with species approved by USFWS and BLM botanists.
4. Within occupied habitat⁶, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
- a. Follow the above (#3) recommendations for project design within suitable habitats;
 - b. Buffers of 300 feet minimum between right of way (roads and surface pipelines) or surface disturbance (well pads) and plants and populations will be incorporated;
 - c. Surface pipelines will be laid such that a 300-foot buffer exists between the edge of the right-of-way and the plants, using stabilizing and anchoring techniques when the pipeline crosses habitat to ensure the pipelines don't move towards the population;
 - d. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.;
 - e. Where technically and economically feasible, use directional drilling or multiple wells from the same pad;
 - f. Designs will avoid altering site hydrology and concentrating water flows or sediments into occupied habitat;
 - g. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, with berms and catchment ditches to avoid or minimize the potential for materials to reach occupied or suitable habitat; and,
 - h. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied habitats within 300' of the edge of the surface pipelines' right-of ways, 300' of the edge of the roads' right-of-ways, and 300' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will

include annual plant surveys to determine plant and habitat impacts relative to project facilities. Habitat impacts include monitoring any changes in hydrology due to project related activities. Annual reports shall be provided to the BLM and the USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the USFWS.

6. Reinitiation of Section 7 consultation with the USFWS will be sought immediately if any loss of plants or occupied habitat for the is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

Uinta Basin Hookless Cactus

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Uinta Basin hookless cactus (*Sclerocactus glaucus*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of Section 7 consultation with the USFWS.

1. Prior to surface disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.
2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not be limited to:
 - the stabilization of soils to minimize or avoid impacts related to soil erosion;
 - marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities (note that markings or flagging must be installed immediately prior to surface disturbing activities and removed immediately after disturbance completion); and,
 - require project proponents to conduct surveys and monitoring actions using BLM-approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of Uinta Basin hookless cactus as they are encountered.
4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to suitable habitat, populations, or individuals where feasible. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.

6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.
7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.
9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – *Special Status Species Management*.
11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).

Clay Reed-mustard

In order to minimize effects to the federally threatened clay reed-mustard, the BLM in coordination with the USFWS developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. The following avoidance and minimization measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat⁷ prior to any ground disturbing activities to determine if suitable clay reed-mustard habitat is present.
2. Site inventories will be conducted within suitable habitat⁸ to determine occupancy. Where standard surveys are technically infeasible and otherwise hazardous due to topography, slope, etc., suitable habitat will be assessed and mapped for avoidance (hereafter, "avoidance areas"); in such cases, in general, 300' buffers will be maintained between surface disturbance and avoidance areas. However, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat. Where conditions allow, inventories:

- a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
 - b. Will be conducted in suitable and occupied⁹ habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected (usually May 1st to June 5th, in the Uintah Basin; however, surveyors should verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower),
 - c. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
 - d. Will include, but not be limited to, plant species lists and habitat characteristics, and
 - e. Will be valid until May 1st the following year.
3. Design project infrastructure to minimize impacts within suitable habitat:
- a. Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300' buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - b. Reduce well pad size to the minimum needed, without compromising safety,
 - c. Limit new access routes created by the project,
 - d. Roads and utilities should share common right-of-ways where possible,
 - e. Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat,
 - f. Place signing to limit off-road travel in sensitive areas, and
 - g. Stay on designated routes and other cleared/approved areas.
4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
- a. Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300' buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - b. Follow the above recommendations (#3) for project design within suitable habitats,

- c. To avoid water flow and/or sedimentation into occupied habitat and avoidance areas, silt fences, hay bales, and similar structures or practices will be incorporated into the project design; appropriate placement of fill is encouraged,
 - d. Construction of roads will occur such that the edge of the right of way is at least 300' from any plant and 300' from avoidance areas,
 - e. Roads will be graveled within occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from May 1st to June 5th (flowering period); dust abatement applications will be comprised of water only,
 - f. The edge of the well pad should be located at least 300' away from plants and avoidance areas, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - g. Surface pipelines will be laid such that a 300' buffer exists between the edge of the right of way and plants and 300' between the edge of right of way and avoidance areas; use stabilizing and anchoring techniques when the pipeline crosses suitable habitat to ensure pipelines don't move towards the population; site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - h. Construction activities will not occur from May 1st through June 5th within occupied habitat,
 - i. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - j. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - k. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and
 - l. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied clay reed-mustard habitats within 300' of the edge of the surface pipelines' right of ways, 300' of the edge of the roads' right of ways, and 300' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the Service. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
6. Reinitiation of Section 7 consultation with the Service will be sought immediately if any loss of plants or occupied habitat for the shrubby reed-mustard is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and

implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA.

Shrubby reed-mustard

In order to minimize effects to the federally endangered shrubby reed-mustard, the BLM in coordination with the USFWS developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. The following avoidance and minimization measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat prior to any ground disturbing activities to determine if suitable shrubby reed-mustard habitat is present.
2. Within suitable habitat, site inventories will be conducted to determine occupancy. Inventories:
 - a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
 - b. Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected (April 15th to August 1st, unless extended by the BLM),
 - c. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
 - d. Will include, but not be limited to, plant species lists and habitat characteristics, and
 - e. Will be valid until April 15th the following year.
3. Design project infrastructure to minimize impacts within suitable habitat:
 - a. Reduce well pad size to the minimum needed, without compromising safety,
 - b. Limit new access routes created by the project,
 - c. Roads and utilities should share common right-of-ways where possible,
 - d. Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat,
 - e. Place signing to limit off-road travel in sensitive areas, and
 - f. Stay on designated routes and other cleared/approved areas.

4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
 - a. Follow the above (#3) recommendations for project design within suitable habitats,
 - b. Construction of roads will occur such that the edge of the right of way is at least 300' from any plant,
 - c. Roads will be graveled within occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from April 15th to May 30th (flowering period); dust abatement applications will be comprised of water only,
 - d. The edge of the well pad should be located at least 300' away from plants,
 - e. Surface pipelines will be laid such that a 300 foot buffer exists between the edge of the right of way and the plants, use stabilizing and anchoring techniques when the pipeline crosses the white shale strata to ensure the pipelines don't move towards the population,
 - f. Construction activities will not occur from April 15th through May 30th within occupied habitat,
 - g. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - h. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - i. Designs will avoid concentrating water flows or sediments into occupied habitat,
 - j. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and
 - k. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied shrubby reed-mustard habitats within 300' of the edge of the surface pipeline right of ways, 300' of the edge of the road right of ways, and 300' from the edge of well pads shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the Service. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
6. Reinitiation of Section 7 consultation with the Service will be sought immediately if any loss of plants or occupied habitat for the shrubby reed-mustard is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA.

Mexican Spotted Owl

The following list of measures provides species-specific guidance, intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Mexican spotted owl (*Strix occidentalis lucida*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of Section 7 consultation with the Service.

1. BLM will place restrictions on all authorized (permitted) activities that may adversely affect the Mexican spotted owl in identified PACs, breeding habitat, or designated critical habitat, to reduce the potential for adverse impacts to the species. Restrictions and procedures have been adapted from guidance published in the Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (USFWS 2002b), as well as coordination between BLM and the Service. Measures include:
 - a. Surveys, according to USFWS protocol, will be required prior to any disturbance related activities that have been identified to have the potential to impact Mexican spotted owl, unless current species occupancy and distribution information is complete and available. All surveys must be conducted by USFWS certified individuals, and approved by the BLM authorized officer.
 - b. Assess habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the appropriate conservation measures below if project activities occur within 0.5 mile of suitable owl habitat, dependent in part on if the action is temporary or permanent: For all temporary actions that may impact owls or suitable habitat:
 - If action occurs entirely outside of the owl breeding season, and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey.
 - If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season.
 - Eliminate access routes created by a project through such means as raking out scars, revegetation, gating access points, etc.
2. For all permanent actions that may impact owls or suitable habitat:
 - Survey two consecutive years for owls according to established protocol prior to commencing of activity.
 - If owls are found, no actions will occur within 0.5 mile of identified nest site.
 - If nest site is unknown, no activity will occur within the designated Protected Activity Center (PAC).
 - Avoid placing permanent structures within 0.5 mi of suitable habitat unless surveyed and not occupied.

- Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 dBA at 0.5 mile from suitable habitat, including canyon rims (Delaney et al. 1997). Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5 mile buffer for suitable habitat, including canyon rims.
 - Limit disturbances to and within suitable owl habitat by staying on designated routes.
 - Limit new access routes created by the project.
3. BLM will, as a condition of approval (COA) on any project proposed within identified PACs, designated critical habitat, or within spatial buffers for Mexican spotted owl nests (0.5 mile), ensure that project proponents are notified as to their responsibilities for rehabilitation of temporary access routes and other temporary surface disturbances, created by their project, according to individual BLM Field Office standards and procedures, or those determined in the project specific Section 7 Consultation.
 4. BLM will require monitoring of activities in designated critical habitat, identified PACs, or breeding habitats, wherein it has been determined that there is a potential for take. If any adverse impacts are observed to occur in a manner, or to an extent that was not considered in the project-specific Section 7 Consultation, then consultation must be reinitiated.
 - a. Monitoring results should document what, if any, impacts to individuals or habitat occur during project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization, or mitigation measures. Monitoring results would be considered an opportunity for adaptive management, and as such, would be carried forward in the design and implementation of future projects.
 5. For all survey and monitoring actions:
 - a. Reports must be provided to affected field offices within 15 days of completion of survey or monitoring efforts.
 - b. Report any detection of Mexican spotted owls during survey or monitoring to the authorized officer within 48 hours.
 6. BLM will, in areas of designated critical habitat, ensure that any physical or biological factors (i.e., the primary constituent elements), as identified in determining and designating such habitat, remains intact during implementation of any BLM-authorized activity.
 7. For all BLM actions that “*may adversely affect*” the primary constituent elements in any suitable Mexican spotted owl habitat, BLM will implement measures as appropriate to minimize habitat loss or fragmentation, including rehabilitation of access routes created by the project through such means as raking out scars, revegetation, gating access points, etc.

8. Where technically and economically feasible, use directional drilling from single drilling pads to reduce surface disturbance, and minimize or eliminate needing to drill in canyon habitats suitable for Mexican spotted owl nesting.
9. Prior to surface disturbing activities in Mexican spotted owl PACs, breeding habitats, or designated critical habitat, specific principles should be considered to control erosion. These principles include:
 - a. Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.
 - b. Avoid surface disturbance in areas with high erosion hazards to the greatest extent possible. Avoid mid-slope locations, headwalls at the source of tributary drainages, inner valley gorges, and excessively wet slopes such as those near springs. In addition, avoid areas where large cuts and fills would be required.
 - c. Locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.
10. Project developments should be designed, and located to avoid direct or indirect loss or modification of Mexican spotted owl nesting and/or identified roosting habitats.
11. Water production associated with BLM authorized actions should be managed to ensure maintenance or enhancement of riparian habitats.

Bonytail, Colorado Pikeminnow, Humpback Chub, and Razorback Sucker

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker, herein referred to as the Colorado River fishes. This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of Section 7 consultation with the USFWS.

1. Monitoring of impacts of site-specific projects authorized by the BLM will result in the preparation of a report describing the progress of each site-specific project, including implementation of any associated reasonable and prudent measures or reasonable and prudent alternatives. This will be a requirement of project proponents and will be included as a condition of approval (COA) on future proposed actions that have been determined to have the potential for take. Reports will be submitted annually to the USFWS - Utah Field Office, beginning after the first full year of implementation of the project, and shall list and describe:
 - Any unforeseen direct or indirect adverse impacts that result from activities of each site-specific project;
 - Estimated levels of impact or water depletion, in relation to those described in the original project-level Consultation effort, in order to inform the USFWS of any intentions to reinstate Section 7 consultation; and,

- Results of annual, periodic monitoring which evaluates the effectiveness of any site-specific terms and conditions that are part of the formal Consultation process. This will include items such as an assessment of whether implementation of each site-specific project is consistent with that described in the BA, and whether the project has complied with terms and conditions.
2. The BLM shall notify the USFWS immediately of any unforeseen impacts detected during project implementation. Any implementation action that may be contributing to the introduction of toxic materials or other causes of fish mortality must be immediately stopped until the situation is remedied. If investigative monitoring efforts demonstrate that the source of fish mortality is not related to the authorized activity, the action may proceed only after notification of USFWS authorities.
 3. Unoccupied, suitable habitat areas should be protected in order to preserve them for future management actions associated with the recovery of the Endangered Colorado River Fish, as well as approved reintroduction, or relocation efforts.
 - BLM will avoid impacts where feasible, to habitats considered most representative of prime suitable habitat for these species.
 - Surface disturbing activities will be restricted within ¼ mile of the channel centerline of the Colorado, Green, Duchesne, Price, White, and San Rafael Rivers.
 - Surface disturbing activities proposed to occur within floodplains or riparian areas will be avoided unless there is no practical alternative or the development would enhance riparian/aquatic values. If activities must occur in these areas, construction will be designed to include mitigation efforts to maintain, restore, and/or improve riparian and aquatic conditions. If conditions could not be maintained, offsite mitigation strategies should be considered.
 4. BLM will ensure project proponents are aware that designs must avoid as much direct disturbance to current populations and known habitats as is feasible. Designs should include:
 - protections against toxic spills into rivers and floodplains;
 - plans for sedimentation reduction;
 - minimization of riparian vegetation loss or degradation;
 - pre-activity flagging of critical areas for avoidance;
 - design of stream-crossings for adequate passage of fish; and,
 - measures to avoid or minimize impacts on water quality at the 25-year frequency runoff
 5. Prior to surface disturbing activities, specific principles will be considered to control erosion. These principles include:
 - Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.
 - Avoid, where possible, surface disturbance in areas with high erosion hazards.

- Avoid mid-slope location of drill pads, headwalls at the source of tributary drainages, inner valley gorges, excessively wet slopes such as those near springs and avoid areas where large cuts and fills would be required.
 - Design and locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.
6. Where technically and economically feasible, project proponents will use directional drilling or multiple wells from a single pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat. Project proponents will ensure that such drilling does not intercept or degrade alluvial aquifers.
 7. Drilling will not occur within 100-year floodplains that contain listed fish species or their designated critical habitats.
 8. The Utah Oil and Gas Pipeline Crossing Guidance (BLM National Science and Technology Center), or other applicable guidance, will be implemented for oil and gas pipeline river/stream crossings.
 9. In areas adjacent to 100-year floodplains, particularly in systems prone to flash floods, BLM will analyze the risk for flash floods to impact facilities. Potential techniques may include the use of closed loop drilling and pipeline burial or suspension as necessary to minimize the potential for equipment damage and resultant leaks or spills.
 10. Water depletions from any portion of the Upper Colorado River drainage basin above Lake Powell are considered to adversely affect the critical habitat of these endangered fish species. Section 7 consultation will be completed with the USFWS prior to any such water depletions.

Additional Best Management Practices Developed by the USFWS and the VFO

The following list of Best Management Practices that will be considered during the development of site-specific projects involving the crossing of major river drainages. Any or all of these measures could be made a part of a specific permit or other approved action. These measures have been routinely made a part of similar permits or actions in the past. The impacts of implementing these measures have been adequately addressed in the Final EIS. Mitigation measures used for pipelines crossing the Green, Duchesne, and White Rivers include:

- At river crossings, the pipeline would be bored under the river bottom to a minimum depth of 15 feet below the river bottom. Entrance and exit holes should be placed outside the 100-year floodplain to the extent practicable.
- Construction will occur when the ground is dry to prevent rutting.
- Emergency shut-off valves should be placed outside the 100-year floodplain on both sides of the river crossing.
- Pipelines should be inspected regularly (i.e. using smart pigs) to ensure pipeline integrity.
- All leaks will be immediately cleaned up and reported to the USFWS (Utah Field Office, 801-975-3330).

- Equipment will be cleaned to remove noxious weeds/seeds and petroleum products prior to moving on site within or adjacent to the floodplain.
- Fueling machinery will occur off site or in a confined, designated area to prevent spillage into waterways and wetlands. Oil booms will be on site and placed downstream of the project site prior to beginning work if equipment will be operating in the low flow channel.
- Materials will not be stockpiled in the riparian area or other sensitive areas, i.e., wetlands.
- Fill materials will be free of fines, waste, pollutants, and noxious weeds/seeds.
- Concrete coating activities or refueling of equipment will not be conducted within 100 feet of all surface water crossings, jurisdictional wetlands and/or the 100- year floodplain.
- If floodplain and riparian vegetation are disturbed during project activities, a detailed reclamation plan for any project-related disturbance within the 100-year floodplain, including site restoration and revegetation procedures, should be developed. The reclamation plan will at a minimum comply with BLM regulations for surface reclamation and use only native plant species. The reclamation plan will be reviewed by the USFWS (Utah Field Office, 801-975-3330) for review prior to construction completion in the 100-year floodplain. Reclamation will occur as soon as site is no longer in use following disturbance. Revegetation, including cottonwood and willow plantings, will occur in the first fall following completion operations. If the first seeding/planting is considered by the USFWS to be unsuccessful, subsequent seedings/plantings will be conducted.

For pipelines crossing the Green River:

- Work will only occur during low-flow periods and will not occur if fish are actively spawning and/or eggs are in the water column and/or gravels. Care will be taken to minimize sedimentation resulting from bank or stream bed disturbance.
- All project employees will be informed of the presence of the endangered fishes in the Green River and the need to:
 - immediately report any identified or suspected leaks and spills;
 - properly dispose of all chemicals and project-related materials;
 - avoid release of chemicals in floodplain or riverine habitats;
 - properly, completely, and efficiently clean up any spills or leaks that occur; and,
 - properly dispose of trash.

For projects that withdrawal water directly out of the Green River (minimization measures from the *Programmatic Water Depletion Biological Opinion for Oil and Gas Development Administered or Permitted by the Bureau of Land Management* (July 2006):

- To avoid entrainment, water should be pumped from an off-channel location – one that does not connect to the river during high spring flows. An infiltration gallery constructed in a BLM and Service approved location is best.
- If the pump head is located in the river channel where larval fish are known to occur, the following measures apply:

- the pump would not be situated in a low-flow or no-flow area as these habitats tend to concentrate larval fishes;
 - the amount of pumping would be limited, to the greatest extent possible, during that period of the year when larval fish may be present; and
 - the amount of pumping would be limited, to the greatest extent possible, during the pre-dawn hours as larval drift studies indicate that this is a period of greatest daily activity.
- All pump intakes would be screened with ¼” mesh material.
 - Any fish impinged on the intake screen would be reported to the USFWS (801.975.3330) and the UDWR: **Northeastern Region**
152 East 100 North, Vernal, UT 84078
Phone: (435) 781-9453

Riparian Area and 100-Year Floodplains (from the Utah BLM Riparian Management Policy and EO 11990 and 11988):

- Uses and activities allowed in riparian areas will be managed consistent with the Utah BLM Riparian Management Policy and in compliance with Executive Orders 11990 and 11988.
- No new surface disturbing activities will be allowed within the 100-year floodplain unless the following criteria can be met:
 - There are no practical alternatives to the surface disturbance; or,
 - All long-term impacts could be fully mitigated; or,
 - The activity would benefit the riparian area.
- As identified in the Utah BLM Riparian Management Policy, riparian areas will be retained in the public land system unless it can be clearly demonstrated that specific sites are so small or isolated that they cannot be managed in an effective manner by BLM or through agreement with State or Federal agencies or interested conservation groups. Riparian management will be coordinated with the interested federal, state and local governments and private conservation groups, etc.

Conservation Measures from the Biological Opinion for the Utah BLM

Land Use Plans (LUP) Amendments BA and Fire Management Plans (FMP) Biological Assessments (2005)

Firefighter and public safety is the first priority in every fire management activity. Setting priorities among protecting human communities, community infrastructure, other property and improvements, and natural and cultural resources must be based on the values to be protected, human health and safety, and costs of protection. The Applicant Committed Resource Protection Measures will apply to the species covered in this consultation, unless a threat to human life or property exists. During the wildfire suppression activities, the Incident Commander has the final decision-making authority for suppression operations and tactics, including implementation of resource protection operations, thereby minimizing or avoiding many effects to federally protected species. However, in the event that measures cannot be implemented during fire

suppression operations due to safety concerns, some effects may occur to federally protected species. In these cases, BLM would initiate emergency consultation with the USFWS for these fire suppression efforts.

Land Use Plan Amendment and Fire Management Plans:

The project proponent commits to the following resource protection measures as identified in the above referenced September 20, 2005 Biological Opinion. These measures have been developed as part of the Proposed Plan to provide statewide consistency in reducing the effects of fire management activities on listed, proposed, and candidate species and their habitats. Resource protection measures for fire management practices use the following codes to represent which actions fall within each of the measures:

SUP: wildland fire suppression,
WFU: wildland fire use for resource benefit,
RX: prescribed fire,
NF: non-fire fuel treatments,
ESR: Emergency Stabilization and Rehabilitation

Measures designed to protect air quality include:

A-1 Evaluate weather conditions, including wind speed and atmospheric stability, to predict impacts from smoke from prescribed fires and wildland fire uses. Coordinate with Utah Department of Environmental Quality for prescribed fires and wildland fire use (RX, WFU).

A-2 When using chemical fuels reduction methods, follow all label requirements for herbicide application (NF).

Measures designed to protect soil and water quality include:

SW-1 Avoid heavy equipment use on highly erosive soils (soils with low soil loss tolerance), wet or boggy soils and slopes greater than 30%, unless otherwise analyzed and allowed under appropriate NEPA evaluation with implementation of additional erosion control and other soil protection mitigation measures. (SUP, WFU, RX, NF, ESR)

SW-2 There may be situations where high intensity fire will occur on sensitive and erosive soil types during wildland fire, wildland fire use or prescribed fire. If significant areas show evidence of high severity fire, then evaluate area for soil erosion potential and downstream values at risk and implement appropriate or necessary soil stabilization actions such as mulching or seeding to avoid excessive wind and water erosion. (SUP, WFU, RX)

SW-3 Complete necessary rehabilitation on fire lines or other areas of direct soil disturbance, including but not limited to water barring fire lines, covering and mulching fire lines with slash, tilling and/or sub soiling compacted areas, scarification of vehicle tracks, OHV closures, seeding and/or mulching for erosion protection. (SUP, WFU, RX)

SW-4 When using mechanical fuels reduction treatments, limit tractor and heavy equipment use to periods of low soil moisture to reduce the risk of soil compaction. If this is not practical,

evaluate sites, post treatment and if necessary, implement appropriate remediation, such as subsoiling, as part of the operation. (NF)

SW-5 Treatments such as chaining, plowing and roller chopping shall be conducted as much as practical on the contour to reduce soil erosion. (NF, ESR)

SW-6 When using chemical fuel reduction treatments follow all label directions, additional mitigations identified in project NEPA evaluation and the Approved Pesticide Use Permit. At a minimum, provide a 100-foot-wide riparian buffer strip for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be in accordance with the label. Herbicides would be applied to individual plants within 10 feet of water where application is critical. (NF)

SW-7 Avoid heavy equipment in riparian or wetland areas. During fire suppression or wildland fire use, consult a Resource Advisor before using heavy equipment in riparian or wetland areas. (SUP, WFU, RX, NF, ESR)

SW-8 Limit ignition within native riparian or wetland areas. Allow low-intensity fire to burn into riparian areas. (RX)

SW-9 Suppress wildfires consistently with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] water bodies. Do not use retardant within 300 feet of water bodies. (SUP, WFU)

SW-10 Plan and implement projects consistent with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] water bodies. Planned activities should take into account the potential impacts on water quality, including increased water yields that can threaten fisheries and aquatic habitat; improvements at channel crossings; channel stability; and downstream values. Of special concern are small headwaters of moderate to steep watersheds, erosive or saline soils; multiple channel crossings; at-risk fisheries, and downstream residents. (RX, NF, ESR)

Measures designed to protect vegetation include:

V-1 When restoring or rehabilitating disturbed rangelands, non-intrusive, non-native plant species are appropriate for use when native species: (1) are not available; (2) are not economically feasible; (3) cannot achieve ecological objectives as well as non-native species; and/or (4) cannot compete with already established native species. (RX, NF, ESR)

V-2 In areas known to have weed infestations, aggressive action should be taken in rehabilitating fire lines, seeding and follow-up monitoring and treatment to reduce the spread of noxious weeds. Monitor burned areas and treat as necessary. All seed used would be tested for purity and for noxious weeds. Seed with noxious weeds would be rejected. (SUP, WFU, RX, NF, ESR)

Measures designed to protect special status species (including threatened and endangered species) include:

SSS-1 Initiate emergency Section 7 consultation with United States Fish and Wildlife Service (Service) upon the determination that wildfire suppression may pose a potential threat to any listed threatened or endangered species or adverse modification of designated critical habitat. (SUP)

SSS-2 Prior to planned fire management actions, survey for listed threatened, endangered, and non-listed sensitive species. Initiate Section 7 consultation with the Service as necessary if a proposed project may affect any listed species. Review appropriate management, conservation and recovery plans and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in the BLM 6840 Manual. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action authorized, funded, or carried out by BLM does not contribute to the need for any species to become listed. (RX, NF, ESR)

SSS-3 Incorporate site-specific conservation measures identified in this BA. (SUP, WFU, RX, NF, ESR)

Measures designed to protect fish and wildlife resources include:

FW-1 Avoid treatments during nesting, fawning, spawning, or other critical periods for wildlife or fish. (RX, NF, ESR)

FW-2 Avoid if possible or limit the size of, wildland fires in important wildlife habitats such as, mule deer winter range, riparian and occupied sage grouse habitat. Use Resource Advisors to help prioritize resources and develop Wildland Fire Situation Analyses (WFSAs) and Wildland Fire Implementation Analyses (WFSAs) and Wildland Fire Implementation Plans (WFIPs) when important habitats may be impacted. (SUP, WFU)

FW-3 Minimize wildfire size and frequency in sagebrush communities where sage grouse habitat objectives will not be met if a fire occurs. Prioritize wildfire suppression in sagebrush habitat with an understory of invasive, annual species. Retain unburned islands and patches of sagebrush unless there are compelling safety, private property and resource protection or control objectives at risk. Minimize burn out operations (to minimize burned acres) in occupied sage grouse habitats when there are not threats to human life and/or important resources. (SUP)

FW-4 Establish fuel treatment projects at strategic locations to minimize size of wildfires and to limit further loss of sagebrush. Fuel treatments may include green stripping to help reduce the spread of wildfires into sagebrush communities. (RX, NF)

FW-5 Use wildland fire to meet wildlife objectives. Evaluate impacts to sage grouse habitat in areas where wildland fire use for resource benefit may be implemented. (WFU, RX)

FW-6 Create small openings in continuous or dense sagebrush (>30% canopy cover) to create a mosaic of multiple-age classes and associated understory diversity across the landscape to benefit sagebrush-dependent species. (WFU, RX, NF)

FW-7 On sites that are currently occupied by forests or woodlands, but historically supported sagebrush communities, implement treatments (fire, cutting, chaining, seeding, etc.) to re-establish sagebrush communities. (RX, NF)

FW-8 Evaluate and monitor burned areas and continue management restrictions until the recovering and/or seeded plant community reflect the desired condition. (SUP, WFU, RX, ESR)

FW-9 Utilize the Emergency Stabilization and Rehabilitation program to apply appropriate post fire treatments within crucial wildlife habitats, including sage grouse habitats. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict establishment of native vegetation. Seed mixtures should be designed to re-establish important seasonal habitat components for sage grouse. Leks should not be re-seeded with plants that change the vegetation heights previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of limited funds for emergency stabilization and rehabilitation actions, prioritize rehabilitation of sage grouse habitats. (ESR)

Measures designed to protect wild horses include:

WHB-1 Avoid fencing that would restrict access to water. (RX, NF, ESR)

Measures designed to protect cultural resources include:

CR-1 Cultural Resource Advisors should be contacted when fires occur in areas containing sensitive cultural resources. (SUP)

CR-2 Wildland fire use is discouraged in areas containing sensitive cultural resources. A Programmatic Agreement is being prepared between the Utah State Historic Preservation Office, BLM, and the Advisory Council to cover the finding of adverse effects to cultural resources associated with wildland fire use. (WFU)

CR-3 Potential impacts of proposed treatments should be evaluated for compliance with the National Historic Preservation Act (NHPA) and the Utah Statewide Protocol. This should be conducted prior to the proposed treatment. (RX, NF, ESR)

Measures designed to protect paleontology resources include:

P-1 Planned projects should be consistent with BLM Manual and Handbook H-8270- 1, Chapter III (A) and III (B) to avoid areas where significant fossils are known or predicted to occur or to provide for other mitigation of possible adverse effects. (RX, NF, ESR)

P-2 In the event that paleontological resources are discovered in the course of surface fire management activities, including fires suppression, efforts should be made to protect these resources. (SUP, WFU, RX, NF, ESR)

Measures designed to protect forestry resources include:

F-1 Planned projects should be consistent with HFRA Section 102(e)(2) to maintain or contribute to the restoration of old-growth stands to a pre-fire suppression condition and to retain large trees contributing to old-growth structure. (SUP, WFU, RX, NF)

F-2 During planning, evaluate opportunities to utilize forest and woodland products prior to implementing prescribed fire activities. Include opportunities to use forest and woodland stands, consider developing silvicultural prescriptions concurrently with fuel treatments prescriptions. (RX, NF)

Measures designed to protect livestock grazing resources include:

LG-1 Coordinate with permittees regarding the requirements for non-use or rest of treated areas. (SUP, WFU, RX, NF, ESR)

LG-2 Rangelands that have been burned by wildfire, prescribed fire, or wildland fire use, would be ungrazed for a minimum of one complete growing season following the burn. (SUP, WFU, RX)

LG-3 Rangelands that have been re-seeded or otherwise treated to alter vegetation composition, chemically or mechanically, would be ungrazed for a minimum of two complete growing seasons. (RX, NF, ESR)

Measures designed to protect recreation and visitor services include:

Rec-1 Wildland fire suppression efforts would preferentially protect Special Recreation Management Areas and recreation site infrastructure in line with fire management goals and objectives. (SUP)

Rec-2 Vehicle tracks created off of established routes would be obliterated after fire management actions in order to reduce unauthorized OHV travel. (SUP, WFU, RX, NF, ESR)

Measures designed to protect land and reality resources include:

LR-1 Fire management practices would be designed to avoid or otherwise ensure the protection of authorized rights-of-way and other facilities located on the public lands, including coordination with holders of major rights-of-way systems within rights-of-way corridors and communication sites. (WFU, RX, NF, ESR)

LR-2 Fire management actions must not destroy, deface, change or remove to another place any monument or witness tree of the Public Land Survey System. (SUP, WFU, RX, NF, ESR)

Measures designed to minimize impacts confounded by hazardous waste include:

HW-1 Recognize hazardous wastes and move fire personnel to a safe distance from dumped chemicals, unexploded ordnance, drug labs, wire burn sites, or any other hazardous wastes. Immediately notify BLM Field Office hazmat coordinator or state hazmat coordinator upon discovery of any hazardous materials, following the BLM hazardous materials contingency plan. (SUP, WFU, RX, NF, ESR)

Measures designed to protect mineral resources include:

M-1 A safety buffer should be maintained between fire management activities and atrisk facilities. (SUP, WFU, RX)

Measures designed to protect wilderness and wilderness study areas (WSAs) include:

Wild-1 The use of earth-moving equipment must be authorized by the field office manager. (SUP, WFU, RX, ESR)

Wild-2 Fire management actions would rely on the most effective methods of suppression that are least damaging to wilderness values, other resources and the environment, while requiring the least expenditure of public funds. (SUP, WFU)

Wild-3 A Resource Advisor should be consulted when fire occurs in Wilderness and WSAs. (SUP, WFU)

Additional Resource Protection Measures

In addition to the Resource Protection Measures listed under the LUP, the Vernal Fire Support Center has instituted the following measures into their FMP.

Measures designed to protect cultural resources include:

CR-4 The implementation of ground-disturbing wildland fire suppression activities and wildland fire use will be prohibited or curtailed in areas where significant and sensitive cultural resource sites are known or suspected to occur. The application of fire retardant will be prohibited in areas known or suspected to contain rock art. (SUP, WFU)

CR-5 If prudent and feasible, areas of traditional cultural concern to Native American groups will be protected during wildland fire suppression activities. If areas of traditional cultural concern are impacted by wildland fires or wildland fire suppression, the BLM would work with affected parties to mitigate impacts. (WFU, RX, SUP)

CR-6 If Native American human remains are discovered on BLM lands during wildland fire suppression, wildland fire use, prescribed fire, non-fire fuels treatments, and emergency stabilization and rehabilitation activities, the BLM will follow procedures identified in the Native American Graves Protection and Repatriation Act and 43 CFR Part 10. If BLM fire suppression activities or emergency stabilization and rehabilitation activities extend onto private or state land, and Native American human remains are discovered, the provisions of the appropriate state laws will be adhered to. (SUP, WFU, RX, NF, ESR)

CR-7 Previously unidentified cultural resources that are identified during the course of project implementation will be avoided until they are documented, evaluated, appropriate notification procedures have been accomplished, and proper management recommendations and requirements have been agreed upon. (SUP, WFU, RX, NF, ESR)

Measures designed to protect Native American religious concerns include:

NAT-1 Consultation will be completed on a site-by-site basis. (SUP, WFU, RX, NF, ESR)

Measures designed to protect water quality include:

SW-4 Plan and implement projects taking into account the potential impacts on water quality, including increased water yields that can threaten fisheries and aquatic habitat, improvements at channel crossings, channel stability, and downstream values. Of special concern are small headwaters of moderate to steep watersheds, erosive soils, multiple channel crossings, at-risk fisheries, and downstream residents. (SUP, WFU, RX, NF, ESR)

Measures designed to protect wilderness and wilderness study areas (WSAs) include:

Wild-4 Minimum Impact Suppression Tactics (MIST) must be employed in the FMU to preserve the Wilderness Study Unit present. (SUP)

Wild-5 Restoration and rehabilitation techniques will be developed that are consistent with guidelines described in BLM Handbook 8550-1 Interim Management Policy for Lands under Wilderness Review. (ESR)

Measures designed to protect fish and wildlife resources include:

FW-10 Seed mixtures should be designed to reestablish important seasonal habitat components for sage grouse. Leeks should not be reseeded with plants that change the vegetation height previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of limited funds for emergency stabilization and rehabilitation actions, prioritize rehabilitation of sage grouse habitats. (ESR)

FW-11 Vegetation treatments would consider the Western Association of Fish and Wildlife Agencies Guidelines for Management of Sage Grouse Populations and Habitats and State and Local Conservation Plans. This is in accordance with the Memorandum of Understanding among the Western Association of Fish and Wildlife Agencies, Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife Service regarding sage grouse management. (WFU, RX, NF, ESR)

Other Management Practices

Other management practices are specific measures and practices which are considered at the project-specific level, on a case by case basis. These practices should be implemented wherever possible, to reduce possible adverse affects, advance the protection, conservation, and recovery of special status species. The management practices would allow flexibility for resource managers to implement protective measures for special status species.

Cultural Resources and Paleontological Resources

- Archeologists can be educated and taught how to identify special status species in order to avoid trampling during excavations and fence construction efforts.

Energy and Mineral Development

- Surface restrictions should be placed in and around known populations of special status species.

Fire Management

- Areas should also be analyzed when a wildfire determination is being made to either let it burn or suppress the fire.

Forestry and Woodlands Resource Management

- Individuals obtaining permits for posts, firewood, and Christmas trees would be directed to areas that do not contain known occupied habitat of special status species.

Lands and Realty Management

- Road construction, maintenance and right-of-way corridors shall be restricted in known populations of special status species.

Recreation

- OHV use should be designated as limited to existing roads and trails where known special status species populations exist.

Vegetation Resource Management

- The use of herbicides, chemical treatments and habitat manipulations should be restricted within special status species populations and habitat.

Wild Horse and Burro Management

- The herding and trapping of wild horses in special status species populations and habitat should be avoided to reduce additional trampling caused by such activities.

LEASE NOTICE: BLACK-FOOTED FERRET

The Lessee/Operator is given notice that the lands in this parcel may contain occupied black-footed ferret habitat, an endangered species under the Endangered Species Act classified as an experimental, nonessential population in the state of Utah. Avoidance and minimization measures that should be followed are included within the *Northeastern Region Black-Footed Ferret Management Plan* published by the Utah Division of Wildlife Resources in 2007. These measures may be updated based on the best available scientific data as it becomes available.

LEASE NOTICE: ENDANGERED FISH OF THE UPPER COLORADO RIVER DRAINAGE BASIN

The Lessee/Operator is given notice that the lands in this parcel contain Critical Habitat for the Colorado River fish (bonytail, humpback chub, Colorado pikeminnow, and razorback sucker) listed as endangered under the Endangered Species Act (ESA), or these parcels have watersheds that are tributary to designated habitat. Critical habitat was designated for the four endangered Colorado River fishes on March 21, 1994 (59 FR 13374-13400). Designated critical habitat for all the endangered fishes includes those portions of the 100-year floodplain that contain primary constituent elements necessary for survival of the species. Avoidance or use restrictions may be placed on portions of the lease. The following avoidance and minimization measures have been

designed to ensure activities carried out on the lease are in compliance with the ESA. Integration, of and adherence to these measures will facilitate review and analysis of any submitted permits under the authority of this lease. Following these measures could reduce the scope of ESA, Section 7 consultation at the permit stage. Current avoidance and minimization measures include the following:

1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s);
2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated;
3. Water production will be managed to ensure maintenance or enhancement of riparian habitat;
4. Avoid loss or disturbance of riparian habitats;
5. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat. Ensure that such directional drilling does not intercept or degrade alluvial aquifers;
6. Conduct watershed analysis for leases in designated critical habitat and overlapping major tributaries in order to determine toxicity risk from permanent facilities;
7. Implement the Utah Oil and Gas Pipeline Crossing Guidance (from BLM National Science and Technology Center);
8. Drilling will not occur within 100-year floodplains of rivers or tributaries to rivers that contain listed fish species or critical habitat; and,
9. In areas adjacent to 100-year flood plains, particularly in systems prone to flash floods, analyze the risk for flash floods to impact facilities, and use closed loop drilling, and pipeline burial or suspension according to the Utah Oil and Gas Pipeline Crossing Guidance, to minimize the potential for equipment damage and resulting leaks or spills. Water depletions from *any* portion of the Upper Colorado River drainage basin above Lake Powell are considered to adversely affect or adversely modify the critical habitat of the four resident endangered fish species, and must be evaluated with regard to the criteria described in the Upper Colorado River Endangered Fish Recovery Program. Formal consultation with USFWS is required for all depletions. All depletion amounts must be reported to BLM.

Additional measures to avoid or minimize effects to the species may be developed and implemented in consultation with the USFWS between the lease sale stage and lease development stage to ensure continued compliance with the ESA.

Potential habitat is defined as areas which satisfy the broad criteria of the species habitat description; usually determined by preliminary, in-house assessment.

Suitable habitat is defined as areas which contain or exhibit the specific components or constituents necessary for plant persistence; determined by field inspection and/or surveys; may or may not contain Uinta Basin hookless cactus. Habitat descriptions can be found in the U.S. Fish and Wildlife Service's 1990 Recovery Plan and Federal Register Notices for the Uinta Basin hookless cactus (<http://www.fws.gov/endangered/wildlife.html>).

Occupied habitat is defined as areas currently or historically known to support Uinta Basin hookless cactus; synonymous with "known habitat."

LEASE NOTICE: MEXICAN SPOTTED OWL

The Lessee/Operator is given notice that the lands in this parcel contain suitable habitat for Mexican spotted owl, a federally listed species. **Insert the following if lease contains Designated Critical Habitat:** *[The Lessee/Operator is given notice that the lands in this lease contain Designated Critical Habitat for the Mexican spotted owl, a federally listed species. Critical habitat was designated for the Mexican spotted owl on August 31, 2004 (69 FR 53181-53298).]* Avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend whether the action is temporary or permanent, and whether it occurs within or outside the owl nesting season. A temporary action is completed prior to the following breeding season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding season and/or causes a loss of owl habitat or displaces owls through disturbances, i.e. creation of a permanent structure. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease are in compliance with the Endangered Species Act (ESA). Integration of, and adherence to these measures, will facilitate review and analysis of any submitted permits under the authority of this lease. Following these measures could reduce the scope of ESA, Section 7 consultation at the permit stage. Current avoidance and minimization measures include the following:

1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s).
2. Assess habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the conservation measures below if project activities occur within 0.5 mile of suitable owl habitat. Determine potential effects of actions to owls and their habitat.
 - a. Document type of activity, acreage and location of direct habitat impacts, type and extent of indirect impacts relative to location of suitable owl habitat.
 - b. Document if action is temporary or permanent.
3. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated.
4. Water production will be managed to ensure maintenance or enhancement of riparian habitat.

5. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in canyon habitat suitable for Mexican spotted owl nesting.
6. For all temporary actions that may impact owls or suitable habitat:
 - a. If the action occurs entirely outside of the owl breeding season (March 1 – August 31), and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey.
 - b. If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity must be delayed until outside of the breeding season.
 - c. Rehabilitate access routes created by the project through such means as raking out scars, revegetation, gating access points, etc.
7. For all permanent actions that may impact owls or suitable habitat:
 - a. Survey two consecutive years for owls according to accepted protocol prior to commencing activities.
 - b. If owls are found, no actions will occur within 0.5 mile of identified nest site. If nest site is unknown, no activity will occur within the designated Protected Activity Center (PAC).
 - c. Avoid drilling and permanent structures within 0.5 mi of suitable habitat unless surveyed and not occupied.
 - d. Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 dBA at 0.5 mile from suitable habitat, including canyon rims. Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5 mile buffer for suitable habitat, including canyon rims.
 - e. Limit disturbances to and within suitable habitat by staying on approved routes.
 - f. Limit new access routes created by the project.

Additional measures to avoid or minimize effects to the species may be developed and implemented in consultation with the U.S. Fish and Wildlife Service between the lease sale stage and lease development stage to ensure continued compliance with the ESA.

LEASE NOTICE: CANADA LYNX

The Lessee/Operator is given notice that the lands in this parcel contain potential habitat for Canada lynx, a federally listed species. Avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend on the nature of the proposed development, as well as proposed timing and location. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease are in compliance with the ESA. Integration of, and adherence to these measures will facilitate review and analysis of any submitted permits under the authority of this lease. Following these measures could reduce the scope of ESA, Section 7 consultation at the permit stage.

Current avoidance and minimization measures are generally adapted from the standards and guidelines listed in Chapter 7 (Conservation Measures) of the LCAS (Ruediger 2000) and include the following:

1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s), and be conducted according to protocol.
2. Based on data and information gathered in item 1, lease activities within, or in proximity to, occupied lynx habitats will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated.
3. Avoid all surface disturbing actions within occupied denning habitat.
4. Avoid construction and surface disturbing actions in proximity to potential denning habitat during the breeding season (mid-April to July).
5. Activities involved with routine maintenance and operation will only occur during daytime hours, when lynx are least active.
6. Where technically and economically feasible, wells will be remotely monitored within lynx habitat.
7. Limit disturbance to and within suitable habitat by staying on approved access routes.
8. Limit new access routes created by the project.
9. Dirt and gravel roads traversing lynx habitat (particularly those that could become highways) should not be paved or otherwise upgraded (e.g., straightening of curves, widening of roadway etc.) in a manner that is likely to lead to significant increases in traffic volume, traffic speed, increased width of the cleared ROW, or would foreseeably contribute to development or increases in human activity in lynx habitat. When these types of upgrades are proposed, a thorough analysis of potential direct and indirect impacts to lynx and lynx habitat should be conducted.
10. Minimize impacts to habitats that support lynx prey.
11. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and to minimize or eliminate drilling in suitable lynx habitat.

Additional measures may also be employed to avoid or minimize effects to the species at the development stage and will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

LEASE NOTICE: UINTA BASIN HOOKLESS CACTUS

The Lessee/Operator is given notice that the lands in this parcel contain suitable habitat for the Uinta Basin hookless cactus, under the Endangered Species Act (ESA). The following avoidance and minimization measures have been developed to facilitate review and analysis of any submitted permits under the authority of this lease:

In order to minimize effects to the federally threatened Uinta Basin hookless cactus, the BLM in coordination with the USFWS, developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. The following avoidance and minimization measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat prior to any ground disturbing activities to determine if suitable Uinta Basin hookless cactus habitat is present.
2. Within suitable habitat, site inventories will be conducted to determine occupancy.
Inventories:
 - a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
 - b. Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected, and during appropriate flowering periods:
 - i. *Sclerocactus brevispinus* surveys should be conducted March 15th to June 30th, unless extended by the BLM
 - ii. *Sclerocactus wetlandicus* surveys can be done any time of the year, provided there is no snow cover,
 - c. Will occur within 115' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 100' from the perimeter of disturbance for the proposed well pad including the well pad,
 - d. Will include, but not be limited to, plant species lists and habitat characteristics, and
 - e. Will be valid until March 15th the following year for *Sclerocactus brevispinus* and one year from the survey date for *Sclerocactus wetlandicus*.
3. Design project infrastructure to minimize impacts within suitable habitat:
 - a. Reduce well pad size to the minimum needed, without compromising safety,
 - b. Limit new access routes created by the project,
 - c. Roads and utilities should share common right-of-ways where possible,
 - d. Reduce width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat,
 - e. Place signing to limit off-road travel in sensitive areas,
 - f. Stay on designated routes and other cleared/approved areas, and

- g. All disturbed areas will be re-vegetated with native species comprised of species indigenous to the area and non-native species that are not likely to invade other areas.
4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
 - a. Follow the above (#3) recommendations for project design within suitable habitats,
 - b. Buffers of 100 feet minimum between the edge of the right of way (roads and surface pipelines) or surface disturbance (well pads) and plants and populations will be incorporated,
 - c. Surface pipelines will be laid such that a 100 foot buffer exists between the edge of the right of way and the plants, use stabilizing and anchoring techniques when the pipeline crosses the habitat to ensure the pipelines don't move towards the population,
 - d. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - e. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - f. Designs will avoid concentrating water flows or sediments into occupied habitat,
 - g. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and
 - h. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
 5. Occupied Uinta Basin hookless cactus habitats within 100' of the edge of the surface pipelines' right-of-ways, 100' of the edge of the roads' right-of-ways, and 100' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the USFWS.
 6. Reinitiation of Section 7 consultation with the USFWS will be sought immediately if any loss of plants or occupied habitat for the Uinta Basin hookless cactus is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

LEASE NOTICE: UTE LADIES'-TRESSES

The Lessee/Operator is given notice that the lands in this parcel contain suitable habitat for Ute ladies'-tresses under the Endangered Species Act (ESA). The following avoidance and minimization measures have been developed to facilitate review and analysis of any submitted permits under the authority of this lease:

In order to minimize effects to the federally threatened Ute ladies'-tresses, the BLM in coordination with the USFWS, developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. Ute ladies'-tresses habitat is provided some protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Although plants, habitat, or populations may be afforded some protection under these regulatory mechanisms, the following conservation measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area, including areas where hydrology might be affected by project activities, within potential habitat prior to any ground disturbing activities to determine if suitable Ute ladies'-tresses habitat is present.
2. Within suitable habitat, site inventories will be conducted to determine occupancy. Inventories:
 - a. Must be conducted by qualified individual(s) and according to BLM and USFWS accepted survey protocols,
 - b. Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance or areas that could experience direct or indirect changes in hydrology from project activities,
 - c. Will be conducted prior to initiation of project activities and within the same growing season, at a time when the plant can be detected, and during appropriate flowering periods (usually August 1st and August 31st in the Uintah Basin; however, surveyors should verify that the plant is flowering by contacting a BLM or USFWS botanist or demonstrating that the nearest known population is in flower),
 - d. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
 - e. Will include, but not be limited to, plant species lists, habitat characteristics, source of hydrology, and estimated hydroperiod, and
 - f. Will be valid until August 1st the following year.
3. Design project infrastructure to minimize direct or indirect impacts to suitable habitat both within and downstream of the project area:

- a. Alteration and disturbance of hydrology will not be permitted,
 - b. Reduce well pad size to the minimum needed, without compromising safety,
 - c. Limit new access routes created by the project,
 - d. Roads and utilities should share common right-of-ways where possible,
 - e. Reduce width of right-of-ways and minimize the depth of excavation needed for the road bed,
 - f. Construction and right-of-way management measures should avoid soil compaction that would impact Ute ladies' tresses habitat,
 - g. Off-site impacts or indirect impacts should be avoided or minimized (i.e., install berms or catchment ditches to prevent spilled materials from reaching occupied or suitable habitat through either surface or groundwater),
 - h. Place signing to limit off-road travel in sensitive areas,
 - i. Stay on designated routes and other cleared/approved areas, and
 - j. All disturbed areas will be re-vegetated with species approved by USFWS and BLM botanists.
4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
- a. Follow the above (#3) recommendations for project design within suitable habitats,
 - b. Buffers of 300 feet minimum between right of way (roads and surface pipelines) or surface disturbance (well pads) and plants and populations will be incorporated,
 - c. Surface pipelines will be laid such that a 300-foot buffer exists between the edge of the right of way and the plants, using stabilizing and anchoring techniques when the pipeline crosses habitat to ensure the pipelines don't move towards the population,
 - d. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - e. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - f. Designs will avoid altering site hydrology and concentrating water flows or sediments into occupied habitat,
 - g. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, with berms and catchment ditches to avoid or minimize the potential for materials to reach occupied or suitable habitat, and

- h. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied Ute ladies'-tresses habitats within 300' of the edge of the surface pipelines' right-of-ways, 300' of the edge of the roads' right-of-ways, and 300' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Habitat impacts include monitoring any changes in hydrology due to project related activities. Annual reports shall be provided to the BLM and the USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
6. Reinitiation of section 7 consultation with the USFWS will be sought immediately if any loss of plants or occupied habitat for the Ute ladies'-tresses is anticipated as a result of project activities.

Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

LEASE NOTICE: CLAY REED-MUSTARD

The Lessee/Operator is given notice that the lands in this parcel contain suitable habitat for clay reed-mustard under the Endangered Species Act (ESA). The following avoidance and minimization measures have been developed to facilitate review and analysis of any submitted permits under the authority of this lease: In order to minimize effects to the federally threatened clay reed-mustard, the BLM in coordination with the USFWS developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. The following avoidance and minimization measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat prior to any ground disturbing activities to determine if suitable clay reed-mustard habitat is present.
2. Site inventories will be conducted within suitable habitat to determine occupancy. Where standard surveys are technically infeasible and otherwise hazardous due to topography, slope, etc., suitable habitat will be assessed and mapped for avoidance (hereafter, "avoidance areas"); in such cases, in general, 300' buffers will be maintained between surface disturbance and avoidance areas. However, site specific distances will need to be approved by USFWS and BLM when disturbance will occur upslope of habitat. Where conditions allow, inventories:
 - a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
 - b. Will be conducted in suitable and occupied habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same

growing season, at a time when the plant can be detected (usually May 1st to June 5th, in the Uintah Basin; however, surveyors should verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower),

- c. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
 - d. Will include, but not be limited to, plant species lists and habitat characteristics, and
 - e. Will be valid until May 1st the following year.
3. Design project infrastructure to minimize impacts within suitable habitat²:
- a. Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300' buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - b. Reduce well pad size to the minimum needed, without compromising safety,
 - c. Limit new access routes created by the project,
 - d. Roads and utilities should share common right-of-ways where possible,
 - e. Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat,
 - f. Place signing to limit off-road travel in sensitive areas, and
 - g. Stay on designated routes and other cleared/approved areas.
4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
- a. Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300' buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - b. Follow the above recommendations (#3) for project design within suitable habitats,
 - c. To avoid water flow and/or sedimentation into occupied habitat and avoidance areas, silt fences, hay bales, and similar structures or practices will be incorporated into the project design; appropriate placement of fill is encouraged,
 - d. Construction of roads will occur such that the edge of the right of way is at least 300' from any plant and 300' from avoidance areas,

- e. Roads will be graveled within occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from May 1st to June 5th (flowering period); dust abatement applications will be comprised of water only,
 - f. The edge of the well pad should be located at least 300' away from plants and avoidance areas, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - g. Surface pipelines will be laid such that a 300' buffer exists between the edge of the right of way and plants and 300' between the edge of right of way and avoidance areas; use stabilizing and anchoring techniques when the pipeline crosses suitable habitat to ensure pipelines don't move towards the population ; site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat,
 - h. Construction activities will not occur from May 1st through June 5th within occupied habitat,
 - i. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - j. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - k. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and
 - l. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied clay reed-mustard habitats within 300' of the edge of the surface pipelines' right of ways, 300' of the edge of the roads' right of ways, and 300' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
6. Reinitiation of section 7 consultation with the USFWS will be sought immediately if any loss of plants or occupied habitat for the shrubby reed-mustard is anticipated as a result of project activities.

Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

LEASE NOTICE: SHRUBBY REED-MUSTARD

The Lessee/Operator is given notice that the lands in this parcel contain suitable habitat for shrubby reed-mustard under the Endangered Species Act (ESA). The following avoidance and

minimization measures have been developed to facilitate review and analysis of any submitted permits under the authority of this lease:

In order to minimize effects to the federally endangered shrubby reed-mustard, the BLM in coordination with the USFWS developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the ESA. The following avoidance and minimization measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat²⁴ prior to any ground disturbing activities to determine if suitable shrubby reed-mustard habitat is present.
2. Within suitable habitat²⁵, site inventories will be conducted to determine occupancy.

Inventories:

- a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
 - b. Will be conducted in suitable and occupied²⁶ habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected (April 15th to August 1st, unless extended by the BLM),
 - c. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
 - d. Will include, but not be limited to, plant species lists and habitat characteristics, and
 - e. Will be valid until April 15th the following year.
3. Design project infrastructure to minimize impacts within suitable habitat²:
 - a. Reduce well pad size to the minimum needed, without compromising safety,
 - b. Limit new access routes created by the project,
 - c. Roads and utilities should share common right-of-ways where possible,
 - d. Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat,
 - e. Place signing to limit off-road travel in sensitive areas, and
 - f. Stay on designated routes and other cleared/approved areas.
 4. Within occupied habitat³, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:

- a. Follow the above (#3) recommendations for project design within suitable habitats,
 - b. Construction of roads will occur such that the edge of the right of way is at least 300' from any plant,
 - c. Roads will be graveled within occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from April 15th to May 30th (flowering period); dust abatement applications will be comprised of water only,
 - d. The edge of the well pad should be located at least 300' away from plants,
 - e. Surface pipelines will be laid such that a 300 foot buffer exists between the edge of the right of way and the plants, use stabilizing and anchoring techniques when the pipeline crosses the white shale strata to ensure the pipelines don't move towards the population,
 - f. Construction activities will not occur from April 15th through May 30th within occupied habitat,
 - g. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
 - h. Where technically and economically feasible, use directional drilling or multiple wells from the same pad,
 - i. Designs will avoid concentrating water flows or sediments into occupied habitat,
 - j. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and
 - k. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied shrubby reed-mustard habitats within 300' of the edge of the surface pipeline right of ways, 300' of the edge of the road right of ways, and 300' from the edge of well pads shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
 6. Reinitiation of section 7 consultation with the USFWS will be sought immediately if any loss of plants or occupied habitat for the shrubby reed-mustard is anticipated as a result of project activities.

Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the USFWS to ensure continued compliance with the ESA.

RE-INITIATION STATEMENT

This is a program-level document that does not include project specific detail for actions authorized by the Resource Management Plan. Additional consultation with USFWS will be necessary for any authorized project specific action that may impact any listed species

This concludes formal consultation on the Vernal BLM Field Office Resource Management Plan. As provided in 50 CFR §402.16, re-initiation of formal consultation is required if: 1) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, 3) a new species is listed or critical habitat designated that may be affected by the action, 4) a project proposing biological control measures is proposed or 5) water depletions are expected to occur.

Thank you for your interest in conserving threatened and endangered species. If we can be of further assistance, please contact Katherine Richardson at (801) 975-3330 ext. 125 or Laura Romin at ext. 123.

A handwritten signature in black ink, appearing to be "Katherine Richardson", written in a cursive style.

- Avoid mixing or applying fire suppressant chemicals (i.e. surfactant foam or retardant formulations) within 300 feet of the stream channel, except when a threat to human life or property exists.
- Avoid transferring water from one watershed into another for the purpose of water drops, as this may aid in spread of water-borne diseases such as whirling disease.
- Manage fire regimens (prescribe and wild) to protect or improve riparian and flood plain habitats.
- Pipeline crossings of perennial, intermittent, and ephemeral stream channels should be constructed to withstand floods of extreme magnitude to prevent breakage and subsequent accidental contamination of runoff during high flow events.
- Surface crossings must be constructed high enough to remain above the highest possible stream flows at each crossing, and subsurface crossings must be buried deep enough to remain undisturbed by scour throughout passage of the peak flow.
- To avoid repeated maintenance of pipeline crossings, hydraulic analysis should be completed in the design phase to eliminate costly repair and potential environmental degradation associated with pipeline breaks at stream crossings